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ABSTRACT

This handbook is designed to meet the need of employers for a comprehensive reference on the types of skills certified by the Institute of Technical Education (ITE), Singapore. It includes all qualifications issued by the ITE and its predecessors: the Diploma in Applied Arts, Industrial Technician Certificate, Certificate in Business Studies, Certificate in Office Skills, Certificate in Retailing, Certificate in Travel Services, National Technical Certificate, and Certificate of Competency. Part I on the ITE certification system describes ITE, policy on skills testing and certification, objectives of the certification system, role of ITE, certificate systems adopted by ITE, skills standards, training and certification, tests, eligibility, award of certificate, certificate of merit, and recognition of ITE qualifications. Part II lists current certification titles. Part III lists certification titles already phased out. Besides the titles of qualifications, Parts II and III provide brief descriptions of the nature of work the holders are capable of performing and the likely job titles with which they may be associated. Appendix A shows the equivalence of certificates given out by the former Technical Education Department of the Ministry of Education, Industrial Training Board, and Adult Education Board. Appendix B provides certification titles that have been changed and those that have been phased out. Appendix C is a chart showing the National Technical Certificate and Certificate of Competency systems. (YLB)

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ITE QUALIFICATIONS

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First Edition, March 1994

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CONTENTS

	Page
Preface	8
PART I: ITE CERTIFICATION SYSTEM	
Institute of Technical Education (ITE)	9
Policy on Skills Testing and Certification	9
Objectives of the Certification System	9
Role of ITE	9
Certificate Systems Adopted by ITE	10
Skills Standards	10
Training and Certification	10
The Tests	12
Eligibility	14
Award of Certificate	14
Certificate of Merit	15
Recognition of ITE Qualifications	15
PART II: CURRENT CERTIFICATION TITL	
Job Titles and Nature of Work of Holders of the Certificate in Business Studies in	
Accounting	16
Secretarial Practice	17
Job Titles and Nature of Work of Holders of the Certificate in Office Skills	
Certificate in Office Skills	18
Job Titles and Nature of Work of Holders of the Certificate in Computer Operations	
Certificate in Computer Operations	19
Job Titles and Nature of Work of Holders of the Certificate in Health Care	
Certificate in Health Care (In-patient)	20
Certificate in Health Care (Out-patient)	20
Job Titles and Nature of Work of Holders of the Certificate in Retailing	
Certificate in Retailing (Sales & Customer Service)	21

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	Page
Job Titles and Nature of Work of Holders of the Certificate in Travel Services	
Certificate in Travel Services (General)	22
Job Titles and Nature of Work of Holders of the Industrial Technician Certificate in	
Electrical Engineering	23
Electronics Engineering	24
Electro-Mechanical Engineering	25
Mechanical & Electrical Drafting & Design	26
Mechanical Engineering	27
Mechatronics Engineering	27
Job Titles and Nature of Work of Holders of the National Technical Certificate Grade 1 in	
Food Preparation	28
Precision Machining Technology	28
Precision Tooling Design	29
Precision Tooling Technology	30
Job Titles and Nature of Work of Holders of the National Technical Certificate Grade 2 in	
Air-Conditioning & Refrigeration	31
Aircraft Mechanics (Airframe Accessories)	31
Aircraft Mechanics (Airframe & Engines)	32
Aircraft Mechanics (Electrical & Instruments)	33
Aircraft Mechanics (Electrics)	34
Aircraft Mechanics (Instrumentation)	34
Aircraft Mechanics (Powerplant)	34
Aircraft Mechanics (Radar & Communication)	35
Aircraft Mechanics (Sheetmetal)	36
Architectural Drafting	37
Boiler/Pipe Fitting & Servicing	37
Cable Jointing	38
Civil/Structural Drafting	39
Diesel Engine Mechanics	40
Electrical Distribution	40
Electrical Drafting	41

	Page
Electrical Installation & Servicing	42
Electrical Power & Machines	42
Electro-Mechanical Maintenance Fitting	43
Electro-Mechanical Servicing	44
Electronics Servicing (Digital Equipment)	44
Electronics Servicing (Electronics Instrumentation)	45
Electronics Servicing (Radio Communication)	45
Electronics Servicing (Video Technology)	46
Fashion Garment	46
Food & Beverage Service	47
Food Preparation	47
Front Office	48
Furniture Production	48
Graphic Reproduction	49
Hairstyling	49
Jewellery Making	50
Lift & Escalator Mechanics	50
Marine Mechanics	51
Marine Steelwork	52
Mechanical Drafting	52
Mechanical Servicing (General)	53
Men's Tailoring	54
Motor Vehicle Mechanics	54
Motor Vehicle Mechanics (Heavy Vehicles)	56
Offset Printing	56
Precision Machine Fitting (Machine Tool)	57
Precision Machining	58
Precision Machining (Grinder)	58
Precision Machining (Lathe)	59
Precision Machining (Miller)	60
Precision Optics	60
Precision Tooling (Injection Mould)	61
Precision Tooling (Press Tool)	62
Process Operation & Control	62

	Page
Sheetmetal Fabrication	63
Tool & Die Making (General)	63
Welding	64
Job Titles and Nature of Work of Holders of the National Technical Certificate Grade 3 in	
Air-Conditioning & Refrigeration	65
Aircraft Mechanics (Airframe & Engines)	65
Aircraft Mechanics (Sheetmetal)	66
Arc Welding	66
Boiler/Pipe Fitting & Servicing	66
Building Drafting	67
Building Servicing	67
Cable Jointing	68
Diesel Engine Mechanics	69
Electrical Installation & Servicing	69
Electro-Mechanical Servicing	70
Electronics Servicing	70
Fashion Garment	71
Food & Beverage Service	71
Food Production	72
Food Preparation (Chinese Cuisine)	72
Furniture Production	72
General Welding	73
Graphic Reproduction	73
Hairstyling	74
Jewellery Making	74
Lift & Escalator Mechanics	75
Marine Mechanics	75
Marine Steelwork	75
Mechanical & Electrical Drafting	76
Mechanical Servicing	76
Men's Tailoring	77
Metal Fabrication	78
Motor Vehicle Mechanics	78

	Page
Offset Printing	78
Precision Machining	79
Precision Optics	79
Sheetmetal Fabrication	80
Upholstery	80
Job Titles and Nature of Work of Holders of the Certificate of Competency in	
Binding & Finishing	82
Die-Casting Machine Setting	82
Electrical Wiring	83
General Fitting	83
Heat Treatment	83
Industrial Sewing Machine Mechanics	84
Lift Adjustment & Maintenance	84
Lift Installation	85
Motor Cycle Mechanics	85
Motor Vehicle Electrician's Work	86
Panel Beating	86
Plastic Injection Moulding Machine Setting	87
Vehicle Spray Painting	87
Woodworking Machine Operation	88
PART III: CERTIFICATION TITLES ALREADY PHASED OUT	
Job Titles and Nature of Work of Holders of the Diploma in Applied Arts in	
Graphic Design	89
Interior Design	89
Job Titles and Nature of Work of Holders of the Industrial Technician Certificate in	
Advertising Art	91
Air-conditioning & Refrigeration Engineering	91
Automotive Engineering	92
Electronics Engineering (Process Instrumentation & Control)	92
Furniture Design & Production	94
Industrial Electronics Engineering	93

	Page
Industrial Plant Engineering	93
Interior Design	94
Mechanical Engineering Drawing & Design	95
Printing Technology – Pre-Press Process	96
Printing Technology – Presswork	96
Three-Dimensional Design	96
Job Titles and Nature of Work of Holders of the National Trade Certificate Grade 2 in	
Accommodation Operations	98
Automatic Machining (Cam-operated Lathe)	99
Electronics Servicing (Consumer Electronics)	99
Electronics Servicing (Television)	100
Furniture Making (Wood)	100
Garment Patternmaking (Ladies' Wear)	101
General Fitting	102
Industrial Electronics	102
Instrumentation & Control	103
Mechanical Servicing (Machine Tool)	104
Pattern Making	104
Plumbing & Pipe Fitting	105
Precision Mechanics	106
Watch Repairing	106
Job Titles and Nature of Work of Holders of the National Trade Certificate Grade 3 in	
Accommodation Operations	107
Compositor's Work	107
Electrical Fitting & Installation (Domestic)	108
Electrical Fitting & Installation (Industrial)	108
Fine Jewellery	109
Furniture Making (Wood)	109
General Fitting	110
Instrumentation & Control	110
Letterpress Printing	110
Pattern Making	111

	Page
Plumbing & Pipe Fitting	111
Watch Repairing	112
Woodmachining	112
Job Titles and Nature of Work of Holders of the Certificate of Competency in	
Barbending	113
Bricklaying	113
Building Carpentry	114
Building Carpentry (Formwork)	114
Building Carpentry (Joinery)	115
Mobile Crane Operation	115
Painting	116
Pipe Fitting	116
Plastering	117
Tiling	118

Appendices

Appendix A – Equivalence of Qualifications

Appendix B – Certification Titles Which Have Been Changed

Appendix C – National Technical Certification and Certificate of Competency Systems

PREFACE

This Handbook on ITE Qualifications is published with the aim of meeting the need of employers for a comprehensive reference on the types of skills certified by the ITE. It is especially useful for drawing up job advertisements, evaluating job applicants, formulating staff training programmes, and granting recognition to employees who have acquired new skills through the ITE system.

The Handbook includes all qualifications issued, by the ITE and its predecessors. These include the Diploma in Applied Arts, the Industrial Technician Certificate, the Certificate in Business Studies, the Certificate in Office Skills, the Certificate in Retailing, the Certificate in Travel Services, the National Technical Certificate and the Certificate of Competency. Besides the titles of qualifications, the Handbook gives brief descriptions on the nature of work the holders are capable of performing and the likely job titles they may be associated with. Reference is made to the Singapore Standard Occupational Classification published by the Department of Statistics, Ministry of Trade & Industry (1990) in identifying the job titles.

Prior to the formation of the ITE, the Craft Certificate, Advanced Craft Certificate, Trade Certificate, Applied and Manual Arts Certificate and Artisan Certificate were isssued by the former Technical Education Department of the Ministry of Education and the Industrial Training Board. The equivalence of these certificates vis-a-vis the qualifications of the ITE is given in Appendix A. The equivalence of the commercial certificates issued by the former Adult Education Board, is also reflected in Appendix A.

The National Trade Certificate issued under the Vocational & Industrial Training Board and the Industrial Training Board has been re-named the National Technical Certificate. Certification titles which have been changed and those which have been phased out over the years are given in Appendix B. A chart showing the National Technical Certificate and the Certificate of Competency systems is at Appendix C.

This Handbook is intended to bring about a greater awareness of the qualifications issued by ITE. Employers are encouraged to use ITE qualifications for recruiting, selecting and assessing skilled personnel and technicians for employment.

Institute of Technical Education
March 1994

PART I: ITE CERTIFICATION SYSTEM

INSTITUTE OF TECHNICAL EDUCATION (ITE)

The Institute of Technical Education (ITE) was formed on 1 April 1992. The membership composition of the ITE is tripartite as provided for in the ITE Act, comprising representatives from the Government, employers in commerce and industry and the National Trades Union Congress.

POLICY ON SKILLS TESTING AND CERTIFICATION

It is the ITE's policy to establish national standards in the major technical areas, including commerce and service, and to conduct national tests and examinations for both institutional and public candidates regularly. The ITE provides testing and certification for institutional trainees in all its regular courses, while public trade testing for workers on a national basis has been developed mainly for the National Technical Certificate (NTC) system. The ITE, together with Lead Industry Bodies, has also embarked on certification for the service sector under the national framework for the certification of service skills.

OBJECTIVES OF THE CERTIFICATION SYSTEM

Prior to the development of a national system of skills certification, industrial workers in Singapore had no means of determining or proving their levels of skill attainment. In order to seek recognition of their skills, they had to take tests conducted by overseas professional bodies. As the process of applying and taking these tests was both time-consuming and inconvenient, many workers did not bother to have their skills certified.

In the 1970s when Singapore became more industrialised, the need for skilled labour increased and it became necessary for a system to be established to set standards, to test and certify industrial skills. Thus, the National Trade Certification system was introduced in 1973 with the following main objectives:

* To facilitate the selection of workers for skilled jobs by employers;
* To facilitate the determination of workers' salaries/wages commensurate with their levels of skill attainment;
* To facilitate the specification of standards or levels to be achieved in upgrading the skills of workers; and
* To facilitate the recognition of skills standard attained for such purposes as licensing, promotion, entitlement of bonuses, and especially in collective agreements and letters of appointment.

ROLE OF ITE

As the authority responsible for skills certification, the ITE fulfils a number of tasks to enable workers in Singapore to obtain certification of their skills. Specifically, the ITE performs the functions of:

* Setting the standards for certification. It does this in conjunction with representatives

of employers, trade unions and relevant government bodies to ensure that the standards set are relevant to and meet the needs of industry;

* Conducting the tests; and
* Awarding the certificates to successful candidates.

CERTIFICATION SYSTEMS ADOPTED BY ITE

The ITE is primarily concerned with producing skilled workers to support Singapore's planned economic growth. To complement the vocational training provided and to facilitate the certification of skills, the ITE has adopted the following systems of certification:

* Certificate in Training Institute Management (CTIM)
* Certificate in Technical Education (CTE)
* Industry Trainer Certificate
* Industrial Technician Certificate (ITC)
* Certificate in Business Studies (CBS)
* Certificate in Office Skills (COS)
* Certificate in Service Skills
* National Technical Certificate (NTC)
* Certificate of Competency (CoC)
* Certificate in BEST (CBEST)
* Certificate in WISE (CWISE)

SKILLS STANDARDS

A skills standard sets out the skills, knowledge and attitudes essential for competence in a specified occupation. The skills standard governs the scope of the training syllabus and the tests for certification. The skills standard is established after a thorough process of occupational analysis involving the participation of experienced workers and supervisors. The competencies are validated by relevant employers. The skills standard is finally endorsed by the respective Training Advisory Committee (TAC) and approved by the Technical Certification Committee (TCC) before implementation. The TAC comprises professionals from industry. The TAC advises the ITE on matters relating to training and certification in the trade areas within its competence. There are 12 TACs serving ITE at present. The TCC is the supreme body which approves skills standards and issue of certificates. It is tripartite in composition with representations from the government, employer organisations and the NTUC.

TRAINING AND CERTIFICATION

Certificate in Training Institute Management

The CTIM is a 9-month course. It deals with the concepts, principles and practices of effective management of training in a technical training institute or an industrial training centre.

Certificate in Technical Education

The CTE programme consists of 6 months of full-time pedagogic training followed by 6 months of supervised field teaching. It equips training officers with pedagogic skills to deliver instructions in the classrooms and workshops effectively.

Industry Trainer Certificate

The Industry Trainer course consists of 3 modules covering Instructional Skills, Coaching Skills and Planning & Implementing Supervised Field Training. Industry personnel who completes the 3 modules and possesses the relevant technical qualifications and working experience will be awarded the certificate.

Industrial Technician Certificate

The ITC course is a 2-year full-time or 3-year part-time programme. Five engineering courses are being offered in this programme currently. The courses prepare trainees to be technicians or junior supervisors in engineering fields.

Certificate in Business Studies

The CBS course is a 2-year full-time programme in ITE. There are 2 courses which provide broad-based training in Accounting and Secretarial Practice to prepare trainees for employment as account assistants, secretaries and related functions in commerce and industry. The CBS courses are also conducted by private schools accredited to ITE as Approved Training Providers.

Certificate in Office Skills

The COS is a one-year full-time training programme in ITE, providing training in the basics of general clerical work. It prepares trainees for employment in the clerical and related office occupations. Prior to 1990, the COS was known as the Preliminary Certificate in Business Studies (PCBS). The COS course is also conducted by private schools accredited to ITE as Approved Training Providers.

Certificate in Service Skills

The certification of various service skills in the respective industries is undertaken jointly by the ITE and the Lead Industry Bodies. Training courses are conducted by Approved Training Centres accredited to ITE. To date the Certificate in Retailing (Sales & Customer Service), Certificate in Travel Services (General), Certificate in Health Care and Certificate in Computer Operations have been awarded.

National Technical Certificate

The NTC is the back-bone of the technical training system in Singapore. It is designed for certifying technical skills that have scope for development up to the level of a master craftsman. Under this system technical skills are classified according to 3 levels as follows:

National Technical Certificate Grade 1 (NTC-1)

This is the highly skilled level comparable to that of a master craftsman and is the highest level of attainment of knowledge and skills in an occupation. This level of skills is normally attained by those who have at least 3 years of relevant working experience and further training after the NTC-2 level.

National Technical Certificate Grade 2 (NTC-2)

This is the skilled level comparable to that of a fully-trained and competent craftsman, normally attained on completion of an approved apprenticeship training or on completion of 2 years' full-time training.

National Technical Certificate Grade 3 (NTC-3)

This is the level of skills normally attained by a person who has completed one year of basic training at a training institute or who has completed an approved apprenticeship training programme.

Module Certificate of the NTC System

The Module Certificate is awarded to a person who has completed a module of the NTC course successfully. A person who has been awarded the Module Certificates in the modules (usually 4) that make up the NTC course is deemed to have attained the standard equivalent to that NTC course.

Certificate of Competency

Not all trade skills can be classified into the 3 levels of the NTC system. For trade skills which are specific and narrow in scope and terminal in nature, the Certificate of Competency (CoC) system is used instead. Under this system, a single-tier classification is used.

A chart on the NTC and CoC systems is shown at Appendix C.

Certificate in BEST

The course is for workers to upgrade their knowledge of English Language and Mathematics to a level of functional competence under the Basic Education for Skills Training (BEST) programme. There are 4 modules in each subject, Modules 1, 2, 3 and 4, which are broadly comparable in standard to Primary 3, 4, 5 and 6 respectively. Each module is of 60-hour duration conducted over 6 months.

Certificate in WISE

The course aims to raise the educational level of workers to GCE 'N' level in English Language and Mathematics under the Worker Improvement through Secondary Education (WISE) programme. There are 4 modules in each subject, Modules 1, 2, 3 and 4 which are broadly comparable to the "normal" stream of Secondary 1, 2, 3 and 4 respectively. The modules are of 100 or 120 hours duration conducted over 6 months.

THE TESTS

Those who are following a course in an ITE technical institute or an approved ITE course conducted by an accredited centre are registered as institutional candidates for the certification tests and examinations.

Assessment of institutional candidates is based on a final examination for the Theory component. Coursework is usually taken into account weighted at 30% while the final examination accounts for 70% of the score. The Practical component is assessed through continuous assessment. In this mode, a series of Practical phase tests are administered at appropriate stages of the course. The phase tests account for 70% of the assessment while coursework accounts for the remaining 30%.

The public trade tests for the NTC and CoC awards require the candidates to take the one-off Theory and Practical tests and the assessment is based solely on these single set of tests. The Theory papers are the same as those taken by the institutional candidates in the final examination.

The Practical tests varies in duration depending on the trade area. For example, the NTC-2 Precision Machining test lasts 16 hours while the NTC-2 Electronics Servicing test lasts 3 hours.

Certificate in Technical Institute Management

At the CTIM level, there are 5 accountable modules of which 2 require end-of-course written examination while the remaining 3 are based on continuous assessment.

Certificate in Technical Education

At the CTE level, there are 8 accountable subjects of which 5 are based on end-of-course written examination, 2 on continuous assessment and one on appraisal of teaching practice.

Industry Trainer Certificate

Industry trainers who complete each module of the Industry Trainer Programme will be assessed through practical assignments or a written tests of 3 hours, depending on the module. The award of Industry Trainer Certificate also takes into consideration relevant technical qualifications and working experience besides passing the 3 modules.

Industrial Technician Certificate

At the ITC level, the trainees are continuously assessed in their Practical Work and are required to sit for an end-of-course written examination. The written examination consists of 5 accountable subjects. The average duration of each subject paper is about 3 hours.

Certificate in Business Studies

At the CBS level, the trainees are continuously assessed in their Practical Work and are required to sit for an end-of-course written examination. The written examination consists of 4 or 5 accountable subjects. The average duration of each subject paper is about 3 hours.

Certificate in Office Skills

At the COS level, the trainees are continuously assessed in their Practical Work and are required to sit for an end-of-course written examination. The written examination consists of 4 accountable subjects. The average duration of each subject paper is about 3 hours.

Certificate in Service Skills

Trainees are continuously assessed in their Practical Work and may be required to undergo Supervised Field Training at the workplace. They are also required to sit for an end-of-course theory examination, the duration of which is about 2 hours.

National Technical Certificate

At the NTC-3 and NTC-2 levels, trainees in the technical institutes are continuously assessed in their Practical Work. In the written theory test, the trainees are tested on the relevant knowledge pertaining to the trade skill. Questions set are normally of the objective type, such as multiple-choice and short statement questions. The average duration of a theory paper is about 2 hours. In some trades, the test may consist of 2 papers.

Module Certificate

Workers who undertake the module courses under the Continuing Education and Training Programme are either continuously assessed in their Practical Work or they have to sit for an end-of-course practical test of about 3 hours' duration. They are also required to sit for a theory test of about 2 hours.

Certificate of Competency

The CoC test normally consists of a practical component only. Where knowledge of the fundamental theory relating to regulations and safety is considered essential, this will form part of the test. The average duration of the practical test is about 5 hours.

ELIGIBILITY

Institutional Test/Examination

All institutional trainees who wish to register for the CTIM, CTE, CBS, COS, ITC, NTC and the various certificates in Service Skills end-of-course final tests/examinations must have completed the relevant full-time or part-time course. They must also meet the attendance requirement and pass the Course/Project Work.

Public Trade Test

All public candidates who wish to register for the NTC-2 tests must meet one of the following requirements:

* Have completed all the modules of an approved NTC-2 course in full-time, part-time or apprenticeship training; or
* Be holders of the NTC-3 and possess a minimum of 3 years of relevant work experience subsequent to obtaining the NTC-3; or
* Be holders of the NTC-3 and possess a minimum of 5 years of relevant work experience.

All public candidates who wish to register for the NTC-3 tests must meet one of the following requirements:

* Have completed all the modules of an approved NTC-3 course in full-time, part-time or apprenticeship training; or
* Possess at least 2 years of relevant work experience.

Applicants who wish to register for the CoC tests must meet one of the following requirements:

* Have completed an approved training at CoC level; or
* Possess at least 2 years of relevant work experience.

AWARD OF CERTIFICATE

The award of the CTIM, CTE, ITC, CBS and COS is based on a pass in each of the accountable subjects in the final examination, taking into account the Practical Work done in the course. For the COS examinations, candidates who did not pass all the accountable subjects are also given certificates reflecting those subjects passed.

In the case of the NTC examinations, a candidate who passes both the practical and theory

tests is awarded the relevant NTC. If a candidate passes only the practical or the theory component, he is issued with a Statement of Results. Holders of Statement of Results for the practical and theory components can exchange them for the full certificate on condition that both theory and practical components are passed within 5 years.

The Module Certificate is awarded to a candidate who passes both the practical and theory tests.

The award of the CoC is based on a pass in the practical test. Where knowledge of the fundamental theory and safety is considered essential, a pass in the theory test is also required.

For the award of the various certificates in the respective Service Skills, a pass in both the theory and practical tests, and satisfactory completion of the supervised field training (if applicable) are required.

A Certificate is issued only once to a successful candidate. If the certificate is lost, no replacement can be made. However, a certified statement may be issued upon a written application by the holder.

CERTIFICATE OF MERIT

The Certificate of Merit (COM) is awarded to institutional candidates who perform exceptionally well in their final examinations/tests. As a guide, the COM is awarded to the top 5% of the final year candidature in each course. Candidates in the ITC, CBS and COS final examination must obtain at least a Grade B (70%) in each of the accountable subjects. Candidates in the NTC or Service Skills courses must obtain a distinction grade (80%) in both the practical and theory tests. Furthermore, the candidates must also pass in each year of the course and the final examination at one sitting.

RECOGNITION OF ITE QUALIFICATIONS

The ITE is concerned with promoting an awareness and acceptance of its certificates, particularly by licensing authorities and employers. The Public Service Commission (PSC) accepts the ITC and the NTC for appointments in the Technical Scheme of Service and the CBS and the COS for appointments in the Clerical Scheme of Service.

The Public Utilities Board (PUB) recognises the NTC-3 Electrical Installation & Servicing for licensing Electricians and Electrical Contractors, and the ITC Electrical Engineering for Electrical Technicians under the Electrical Workers & Contractors Licensing Act, 1974.

ITE qualifications are increasingly used in recruitment advertisements and in collective agreements.

PART II: CURRENT CERTIFICATION TITLES

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE IN BUSINESS STUDIES

Certificate In Business Studies (Accounting)

Job Title	*Nature of Work*
* Accounts Assistant	• Checks entries, makes necessary calculations and summarises totals..
* Accounts Payable (or Receivable) Bookkeeper	• Balances books at regular intervals.
* Audit Clerk	• Prepares statements of account for issue to customers.
* Bonds Clerk	• May prepare extracts and supplies details of accounts as required.
* Bookkeeping Clerk	• May prepare preliminary and final trial balances for audit purposes.
* Brokerage Clerk	• May inspect entries in cash books, journals, ledgers and other accounting records for correct recording of transactions.
* Collateral Clerk	• May examine documents such as expense documents, cash receipts, sales tickets, bank statements, inventory and stock records to verify accuracy and validity of recorded information.
* Cost Clerk	• May check arithmetical totals and correct errors or list discrepancies for adjustments.
* Data Processing Control Clerk	• May prepare reports and statements of account as directed.
* Finance Clerk	• May examine records such as time or production sheets, payrolls, operation charts and schedules, and extract data for calculations.
* Ledger Clerk	• May calculate actual or estimated cost of individual items such as labour, materials, and time costs and overhead expenses.
* Material Planning Clerk	• May prepare analyses, statements or comparisons of unit or total costs as required.
* Order Clerk (Materials)	
* Payroll Clerk	
* Production Planning Clerk	
* Purchasing Clerk	
* Remittance Clerk	
* Securities Clerk	
* Statistical Clerk (General)	
* Stock Control Clerk	
* Stock Records Clerk	
* Store Clerk	
* Tax Clerk	

Certificate In Business Studies (Secretarial Practice)

Job Title	*Nature of Work*
* Personal Assistant * Shorthand Typist (General) * Shorthand Verbatim Reporter * Stenographer * Stenographic Secretary * Stenographic-Typist (General)	• Types letters, memos, tables, forms and other business documents. • Takes dictation in shorthand and transcribes into appropriate typewritten forms. • Prepares from shorthand notes and/or audio-dictation correspondence, minutes, reports, etc for signature and despatch. • Prepares simple routine correspondence from dictated or written notes. • Operates office machines and equipment. • Screens telephone calls and takes telephone messages. • Receives visitors. • Opens incoming mail, sorts them into priority order and attaches relevant documents/files for an employer's attention. • Liaises with members of other divisions/ departments. • Makes travel arrangements. • Keeps office diaries and schedules appointments. • Arranges for meetings, seminars or talks. • Keeps simple petty cash records. • Drafts telexes and telegrams. • Types telex and telegram messages in the correct format. • Replies to routine correspondence.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE IN OFFICE SKILLS

Certificate In Office Skills

Job Title	*Nature of Work*
* Bank Cashier	• Types letters, minutes, reports and other documents.
* Bank Teller	• Operates office machines and equipment.
* Billing Clerk	• Files correspondence, reports and other documents.
* Box Office Cashier	• Keeps and balances simple financial accounts including petty cash and current account.
* Cash Accounting Clerk	• Sorts and distributes incoming mail.
* Cashier (General)	• Prepares outgoing mail for despatch.
* Clerical Assistant	• Receives visitors and incoming telephone calls.
* Coding Clerk (Data Processing)	• Completes standard business letters.
* Despatching & Receiving Clerk	• Prepares documents for making orders, sales transactions and payments.
* Enquiries Clerk	• Performs basic calculations necessary in a business setting.
* Filing Clerk	• Makes and answers telephone enquiries.
* General Office Clerk	
* Information Clerk	
* Invoice Clerk	
* Library Clerk	
* Mail Sorting Clerk	
* Office Cashier	
* Parcel Clerk (Railway)	
* Personnel Assistant	
* Postal Clerk	
* Restaurant Cashier	
* Sales Clerk	
* Store Cashier	
* Telephone Operator	
* Telephonist	
* Typist	
* Weighing Clerk	

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE IN COMPUTER OPERATIONS

Certificate In Computer Operations

Job Title	*Nature of Work*
* Computer Operator (Electronic Data Processing)	• Performs regular system backups. • Handles routine computer operations which includes execution of programs, printing and distribution of reports. • Monitors on-going computer operations. • Monitors data communication equipment error alarm and system error messages. • Provides a 'hotline' service for user complaints. • Performs simple hardware troubleshooting and checks. • Applies widely used personal computer software applications.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE IN HEALTH CARE

Certificate In Health care (In-patient)

Job Title	*Nature of Work*
* Hospital Aid * Hospital Attendant * Nursing Aid	• Orientates patients admitted to the ward. • Performs basic patient care. • Measures and records observations on patients. • Responds to emergency situations as necessary. • Assists nursing care team in maintaining a safe and comfortable environment. • Assists nursing care team in the discharge procedure for patients.

Certificate In Health Care (Out-patient)

Job Title	*Nature of Work*
* Clinic Receptionist * Doctor's Receptionist * Medical Assistant * Medical Receptionist	• Performs reception duties at the clinic. • Maintains clinic records of patients. • Handles simple correspondence. • Performs health screening and basic laboratory tests for patients. • Assists doctors in clinical examination. • Prepares patients for minor surgery. • Packs and labels medication. • Dispenses and instructs patients on medication. • Receives payment from patients. • Advises patients on general health care. • Maintains inventory of supplies and drugs. • Keeps clinic facilities clean and tidy. • Performs first aid in emergencies.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE IN RETAILING

Certificate In Retailing (Sales & Customer Service)

Job Title	*Nature of Work*
* Retail Trade Salesman * Shop Assistant	• Sells merchandise in a retail establishment. • Ascertains nature and quality of merchandise required. • Advises and assists customers in their choice by demonstrating and describing characteristics of merchandise available. • Packs and arranges the delivery of merchandise sold, where necessary. • Replenishes merchandise on display. • Arranges floor display for promotion items. • Takes inventories. • Price-tags merchandise. • Keeps work areas and merchandise clean and tidy.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE IN TRAVEL SERVICES

Certificate In Travel Services (General)

Job Title	*Nature of Work*
* Ticketing Clerk (Travel Agency) * Travel Agency Clerk * Travel Reservation Clerk * Travel Service Clerk	• Performs counter sales duties of the travel company. • Provides travel-related information. • Arranges itineraries for tours/flights. • Makes bookings for flights/accommodation. • Computes and issues air tickets. • Maintains records of clients. • Prepares billing documents. • Maintains good rapport with clients and business contacts. • Handles sales and reservation functions on the phone. • Liaises with different suppliers and overseas National Tourist Offices. • Completes international travel documents according to rules and procedures. • Performs general computerised reservations functions.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE INDUSTRIAL TECHNICIAN CERTIFICATE

Industrial Technician Certificate In Electrical Engineering

(Trainees attending the course are allowed to specialise in one of the following areas – Electrical Power & Maintenance, Instrumentation & Control, Lift & Escalator or Building Services (Mechanical & Electrical))

Job Title	*Nature of Work*
* Electrical Engineering Assistant (General) * Electrical Engineering Technician (General) * Instrumentation Technician (Electrical) * Power Distribution Technician (Electricity) * Power Generation Technician (Electricity) * Power Transmission Technician (Electricity)	• Performs electrical installation work according to specifications, and blueprint drawings at the skill level. • Supervises the progress, tests and turns on additional alterations or new installations. • Assists professional electrical engineers in the installation, supervision, testing, operation and maintenance of large electrical systems.

In addition, for graduates specialising in Electrical Power & Maintenance:

- Installs, supervises, inspects, tests and commissions electrical systems and machinery.
- Diagnoses and rectifies faults in electrical installations and machinery.
- Schedules preventive maintenance work and distributes work/duties to a team of mechanics.

For graduates specialising in Instrumentation & Control:

- Reads and interprets readings and indications of process instruments.
- Fits and installs process instruments according to blueprint drawings.
- Tests, adjusts, calibrates and repairs process instruments.
- Designs simple process control systems.

For graduates specialising in Lift & Escalator:

- Reads, interprets and prepares drawings relating to installation of lifts and escalators.
- Assembles, installs, tests, commissions, maintains, diagnoses and repairs electrical and mechanical faults in lifts and escalators.

For graduates specialising in Building Services (Mechanical & Electrical):

- Maintains various mechanical and electrical services in buildings, such as electrical distribution, fire protection and detection systems, security systems, air-conditioning systems, lifts and escalators, mechanical ventilation and pump systems.

Industrial Technician Certificate In Electronics Engineering

(Trainees attending the course are allowed to specialise in one of the following areas – Video Systems, Radio Communication & Navigational Aids, Computer Technology)

Job Title	*Nature of Work*
* Audio and Video Equipment Technician	• Performs technical tasks, normally under the direction and supervision of electronics engineers. Contributes to the design, development, construction, installation, maintenance and repair of electronic systems and equipment.
* Computer Systems Technician	• Assists in research and development work relevant to electronic systems and equipment.
* Electronics Engineering Assistant (General)	• Assists in technical supervision in manufacturing, installation and utilisation of electronic systems and equipment.
* Electronics Engineering Technician (General)	• Maintains and repairs electronic systems and equipment. Applies knowledge of electronics engineering theory and practice to resolve problems arising in the course of work.
* Instrumentation Technician (Electronic)	• Schedules and distributes work/duties and supervises daily production in a production line.
* Radar Technician	• Provides technical advice/information, demonstration and suggestion on suitable instruments and equipment for a particular application.
* Radio and Television Technician	• Performs computer programming in machine language, assembly language and Basic language.
* Telecommunications Technician	

In addition, for graduates specialising in Video Systems:

- Diagnoses faults in video systems using test equipment.
- Trouble-shoots and repairs television receivers, video cassette recorders, closed-circuit TV systems and related video equipment.
- Installs and maintains video systems.

For graduates specialising in Radio Communication & Navigational Aids:

- Diagnoses faults in communication systems using test equipment.
- Trouble-shoots and repairs radio transceivers, radar transceivers and related communication equipment.

For graduates specialising in Computer Technology:

- Diagnoses faults in computer systems using test equipment.
- Trouble-shoots and repairs microcomputer, computer peripheral and microprocessor-based equipment.
- Installs and maintains computer systems.

Industrial Technician Certificate
In Electro-Mechanical Engineering

Job Title

* Automation Technician

* Industrial Engineering Assistant (General)

* Industrial Engineering Technician (General)

* Mechatronics Technician

Nature of Work

- Interprets electrical, electronic, pneumatic, hydraulic and mechanical system specifications and schematics.
- Installs and tests electrical, electronic, pneumatic, hydraulic and mechanical machines.
- Fabricates simple electronic circuits and machine parts.
- Modifies electric wiring in new and existing installations.
- Diagnoses faults on electrical, electronic, pneumatic, hydraulic and mechanical systems.
- Services and tests controllers and transmitters.
- Modifies production machines and equipment.
- Maintains industrial automated machinery.

Industrial Technician Certificate
In Mechanical & Electrical Drafting & Design

Job Title

* Draughtsman (General)
* Electrical Draughtsman
* Mechanical Draughtsman
* Mechanical Engineering Assistant (General)
* Structural Engineering Assistant (General)
* Structural Engineering Draughtsman
* Ventilation Systems Draughtsman

Nature of Work

- Interprets engineers' sketches, notes and specifications and makes necessary adjustments to and supportive calculations of dimensions.
- Collects data on site for preparation of working drawings.
- Uses relevant standard codes and regulations for preparing of working drawings.
- Designs simple components or parts of machines and mechanical units.
- Designs simple air-conditioning ducting systems, building services piping systems and electrical installations for buildings.
- Prepares working drawings for air-conditioning ducting & piping, building services piping, electrical installations and control circuits, engineering components, mechanical units, structural steelwork and process piping systems.
- Makes necessary changes in drawings as required by engineers.
- Uses the CADD system to prepare working drawings for air-conditioning ducting & piping, building services piping, electrical installations, engineering components, mechanical units and process piping systems.

Industrial Technician Certificate
In Mechanical Engineering

(Trainees attending the course are allowed to specialise in one of the following areas – Industrial Automation & Robotics, Plant & Equipment Maintenance, Tool Design & CNC Technology).

Job Title

* Industrial Engineering Assistant (General)
* Industrial Engineering Technician (General)
* Mechanical Engineering Assistant (Motor & Engines)
* Mechanical Engineering Technician (Motor & Engines)
* Production Engineering Assistant

Nature of Work

- Uses precision measuring tools and equipment for engineering measurements.
- Prepares planning and production schedules.
- Produces components using conventional machine tools.
- Designs and manufactures projects.
- Performs routine maintenance, minor repairs and trouble-shoots faults in machine tools and equipment.

* Production Engineering Technician

In addition, for graduates specialising in Industrial Automation & Robotics:

- Uses automation components in manufacturing processes and integrate them into the system; programs, operates and maintains industrial robots.

For graduates specialising in Plant & Equipment Maintenance:

- Maintains, trouble-shoots and repairs industrial plant and equipment with special emphasis on air-conditioning and refrigeration systems.

For graduates specialising in Tool Design & CNC Technology:

- Designs jigs and fixtures, simple press tools and plastic moulds, form tools and gauges; programs and operates CNC machine tools.

Industrial Technician Certificate In Mechatronics Engineering

Job Title

* Automation Technician
* Industrial Engineering Assistant (General)
* Industrial Engineering Technician (General)
* Mechatronics Technician

Nature of Work

- operates, trouble-shoots, inspects, tests and maintains industrial automation systems such as Computer Numerical Control (CNC) machines, industrial robots, etc, in modern manufacturing or engineering environment.
- Maintains, modifies or overhauls automated machinery to keep the assembly line function in a normal and efficient manner.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE NATIONAL TECHNICAL CERTIFICATE GRADE 1

National Technical Certificate Grade 1 In Food Preparation

Job Title

* Chef de Cuisine (Restaurant)
* Chef de Partie (Restaurant)
* Hotel Cook

Nature of Work

- Creates new dishes according to special themes.
- Supervises the preparation of meals in the kitchen to ensure quality control.
- Enforces proper sanitation, hygiene and safety standards in the kitchen.
- Assists the Executive Chef in the planning and costing of menus.
- Organises work flow and manning requirements.
- Supervises all section heads (Chef de Partie) in the kitchen.
- Checks to ensure proper maintenance of all kitchen equipment, appliances and utensils.
- Assists the Executive Chef in cost control and budgeting for the kitchen.
- Prepares the quality specifications for the purchase of all food products especially perishables, like vegetables, meats and seafood.
- Ensures proper storage and preservation of raw food and cooked food products.
- Coordinates with relevant departments on food and beverage promotions and banquet sales.

National Technical Certificate Grade 1 In Precision Machining Technology

Job Title

* CNC Machine Programmer
* Machineshop Co-ordinator
* Machineshop Supervisor
* Production Engineering Assistant
* Production Engineering Technician

Nature of Work

- Designs jigs & fixtures and precision components on computer-based software, CAD and drawing boards.
- Reads and interprets complex components and jigs & fixtures drawings.
- Selects orders and prepares materials for fabrication.
- Plans and optimises maximum machining capacities.

- Manufactures complex components, jigs & fixtures and precision gauges with typical precision engineering machines, including application of CAD/CAM on CNC lathe, CNC machining centre, CNC miller and CNC grinder.
- Heat-treats jigs & fixtures and precision components.
- Controls precision manufactured components and jigs & fixtures with profile projector, tool-maker microscope and 3-axis coordinate measuring machine.
- Sets up and operates components and fixtures on CNC machines.
- Repairs and modifies jigs & fixtures.
- Trouble-shoots on machines and jigs & fixtures.
- Ensures quality control of products.
- Carries out statistical process control of products.

National Technical Certificate Grade 1
In Precision Tooling Design

Job Title

* Die Designer
* Engineering Assistant
* Mould Designer
* Tool Designer
* Tool & Die Technician

Nature of Work

- Designs tools on computer-based software, CAD/CAM and drawing boards.
- Interprets complex tool drawings.
- Selects and orders materials for fabrication of tooling.
- Prepares materials for fabrication of tooling.
- Selects appropriate presses or moulding machines for production.
- Designs complex tools based on machining capability of typical toolroom machines, including applications of CAM on CNC machining centre, CNC milling, CNC EDM, CNC wire-cut and CNC grinding.
- Trouble-shoots and modifies existing tooling.
- Plans and co-ordinates tooling manufacture and production.
- Standardizes work methods and initiates productivity improvement.
- Designs and develops product.

National Technical Certificate Grade 1
In Precision Tooling Technology

Job Title	*Nature of Work*
* Die Maker * Press Tool Maker * Tool & Die Maker * Toolsmith	• Designs tools on computer-based software, CAD and drawing boards. • Reads and interprets complex tool drawings. • Selects, orders and prepares materials for fabrication of tooling. • Optimises job flow. • Utilises maximum machining capacity. • Manufactures complex tools with typical toolroom machines, including CNC machining centre, CNC miller, CNC EDM and wire-cut EDM. • Heat-treats tools and components. • Controls precision manufactured inserts and tool components with profile projectors, toolmaker microscope and 3-axis coordinate measuring machines. • Sets and operates presses and injection moulding machines. • Repairs and modifies tool components. • Trouble-shoots on machines and tools. • Controls quality assurance of products.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE NATIONAL TECHNICAL CERTIFICATE GRADE 2

National Technical Certificate Grade 2 In Air-Conditioning & Refrigeration

Job Title

* Air-Conditioning & Refrigerating Equipment Installer
* Air-Conditioning & Refrigerating Equipment Mechanic
* Air-Conditioning Engineering Technician
* Electrical Fitter (Refrigeration & Air-Conditioning Equipment)
* Refrigeration & Air-Conditioning Plant Installer
* Refrigeration Engineering Technician
* Refrigeration Equipment Erector
* Ventilation Engineering Technician

Nature of Work

- Services domestic, commercial and industrial air-conditioning or refrigeration equipment.
- Diagnoses, repairs and tests air-conditioning or refrigeration equipment.
- Writes reports about corrective actions taken during repairs.
- Determines job requirements from drawings or other specifications.
- Installs machinery and related fittings in air-conditioning and refrigeration plant, including domestic installations.
- Interprets electrical or piping circuit diagrams of air-conditioning and refrigeration equipment.
- Rectifies electrical and mechanical malfunctions in equipment, based on test results and other data.
- Installs repaired parts and fittings in air-conditioning and refrigeration equipment.
- Checks the operation of equipment, using electrical and mechanical measuring instruments.

National Technical Certificate Grade 2 In Aircraft Mechanics (Airframe Accessories)

Job Title

* Aeronautical Engineering Assistant
* Aeronautical Engineering Technician
* Aeronautical Mechanic
* Aircraft Pipe & Tube Fitter
* Hydraulic Systems Mechanic (Aircraft)

Nature of Work

- Works under supervision in a workshop and in accordance with approved servicing, maintenance and overhaul manuals, including other relevant technical instructions.
- Receives and verifies parts for correctness and authenticity.
- Inspects parts and components for wear and tear, security of attachment, cracks and other defects for their serviceability.

- Assists in trouble-shooting aircraft components such as pneumatics, hydraulics, flight controls, air-conditioning and pressurisation, fire detection and extinguishers, landing gears, water and waste systems, fuel tanks and accessories.
- Rectifies faults by adjustments.
- Checks and does minor repairs on airframe components and accessories according to the information supplied in the defects report forms.
- Replaces worn and defective parts.
- Re-assembles components and carries out functional tests.
- Uses special test equipment and tools according to approved procedures.
- Interprets blueprints/drawings of engineering notes and manuals.
- Carries out documentation of works performed.

National Technical Certificate Grade 2
In Aircraft Mechanics (Airframe & Engines)

Job Title

* Aeronautical Engineering Assistant
* Aeronautical Engineering Technician
* Aeronautical Mechanic
* Aircraft Engine Mechanic
* Aircraft Pipe & Tube Fitter
* Hydraulic Systems Mechanic (Aircraft)
* Service Mechanic (Aircraft Engine)

Nature of Work

- Works under supervision in a hanger or line sector and in accordance with approved servicing, maintenance and overhaul manuals, including other relevant technical instructions.
- Receives and verifies parts for correctness and authenticity.
- Performs flight line and periodic/phase servicing of airframe and engine systems.
- Inspects parts and components for wear and tear, security of attachment, cracks and other defects for their serviceability.
- Rectifies faults by adjustments.
- Checks and does minor repairs on airframe and engine systems according to the information supplied in the defect report forms.
- Replaces worn and defective parts.
- Assists in the removal or re-fit of engine components and carries out functional tests.

- Assists in carrying out functional checks on airframe systems.
- Assists in rigging control systems.
- Assists in trouble-shooting aircraft systems.
- Uses special test equipment and tools according to approved procedures.
- Interprets blueprints/drawings of engineering notes and manuals.
- Carries out structural and component repairs, including disassembly of airframe and related parts.
- Carries out documentation of works performed.

National Technical Certificate Grade 2
In Aircraft Mechanics (Electrical & Instruments)

Job Title

* Aircraft Electrician

* Instrumentation Technician (Electrical)

* Signal Systems Technician (Electrical)

Nature of Work

- Installs, maintains and repairs electrical and instrument wiring, and related equipment in an aircraft.
- Uses electricians' hand tools and equipment and maintains them in good order.
- Installs electrical and instrument systems in an aircraft.
- Examines wiring and equipment such as switches, relays, solenoids, warning horns, lamps, circuit breakers and protective devices.
- Interprets mechanical and electrical drawings of an aircraft.
- Diagnoses faults in aircraft electrical and instrument systems using measuring and test equipment such as insulation testers, bonding testers, multimeters, pitot-static testers and fuel quantity testers.
- Maintains and rectifies faults in an aircraft electrical system and its related equipment such as generators, batteries, lights and fire protection devices.
- Maintains and rectifies faults in an aircraft instrument system and its related equipment such as altimeters, compasses, auto-pilots, turn and bank indicators, and engine speed indicators.

National Technical Certificate Grade 2
In Aircraft Mechanics (Electrics)

Job Title	*Nature of Work*
* Aircraft Electrician * Instrumentation Technician (Electrical) * Signal Systems Technician (Electrical)	• Maintains, overhauls and modifies aircraft electrical components in a workshop. • Installs, examines and removes wiring and electrical components in engine installation and airframe accessories. • Uses electrical workshop tools and equipment and maintains them in good order. • Uses test sets and equipment for trouble-shooting components during maintenance and overhaul. • Maintains and calibrates electrical workshop test sets and equipment. • Interprets mechanical and electrical drawings of aircraft, electrical systems, components and test equipment.

National Technical Certificate Grade 2
In Aircraft Mechanics (Instrumentation)

Job Title	*Nature of Work*
* Aeronautical Engineering Assistant * Aeronautical Engineering Technician * Electronic Instrument Fitter * Instrumentation Technician (Electronic)	• Maintains, overhauls and modifies aircraft instrumentation components in a workshop. • Uses instrument workshop tools and equipment and maintains them in good order. • Uses test sets and equipment for trouble-shooting components during maintenance and overhaul. • Maintains and calibrates instrument workshop test sets and equipment. • Interprets mechanical and electrical drawings of aircraft, instrument systems, components and test equipment.

National Technical Certificate Grade 2
In Aircraft Mechanics (Powerplant)

Job Title	*Nature of Work*
* Aeronautical Engineering Assistant * Aeronautical Engineering Technician	• Works under supervision in the workshop sector and in accordance with the approved servicing, maintenance and overhaul manuals, including other technical instructions.

* Aeronautical Mechanic
* Aircraft Engine Mechanic
* Hydraulic Systems Mechanic (Aircraft)
* Service Mechanic (Aircraft Engine)

- Receives and verifies parts for correctness and authenticity.
- Assists in trouble-shooting powerplant systems and accessories such as carburettors, fuel pumps, ignition and igniters, oil pumps, engine starters, gearboxes, drive systems, transmission systems, fire detectors and extinguishers, propellers and their mechanisms, jet pipes and exhaust systems.
- Inspects parts for wear, tear, corrosion and cracks.
- Inspects components and systems for serviceability, security of attachment and operation.
- Assists in engine performance checks and rectifies defects.
- Replaces worn and defective parts.
- Replaces engine components.
- Purges and replenishes fuel systems, pumps and fuel control units.
- Carries out functional checks on engines.
- Interprets blueprints/drawings of engineering notes and manuals.
- Overhauls piston or gas turbine engines.
- Carries out documentation of works performed.

National Technical Certificate Grade 2
In Aircraft Mechanics (Radar & Communication)

Job Title

* Aeronautical Engineering Assistant
* Aeronautical Engineering Technician
* Radar Technician
* Signal Systems Technician (Electronic)

Nature of Work

- Installs, maintains, and repairs avionics wiring and related accessories in an aircraft.
- Uses electricians' hand tools and electronic test equipment, and maintains them in good order.
- Installs and replaces radar and communication systems, and other accessories in an aircraft.
- Interprets technical drawings and wiring diagrams of an aircraft.
- Inspects and maintains equipment and accessories, such as switches, relays, lamps, terminal blocks, connectors, circuit breakers and protective devices.

- Uses insulation testers, bonding testers, universal field testers, multimeters and power output meters for the diagnosis of faults in aircraft radar and communication systems.
- Maintains and repairs aircraft radar, communication and navigation equipment.

National Technical Certificate Grade 2
In Aircraft Mechanics (Sheetmetal)

Job Title	*Nature of Work*
* Aircraft Pipe & Tube Fitter * Aircraft Rigger * Aircraft Sheetmetal Worker	• Works under supervision and in accordance with approved repair, overhaul and modification procedures in manuals and other relevant documents. • Orders metals, parts, hardware and components in accordance with relevant procedures. • Receives and verifies parts for their correctness of specifications and temper values. • Prepares and treats corroded surfaces. • Removes and re-installs rivets. • Heat-treats and preserves rivets and metals. • Prepares and applies anti-corrosive treatment before joining metals. • Cuts, drills and de-burrs sheetmetal, angles and flanges. • Marks and cuts sheetmetal for bending and shaping. • Fabricates rigid metal tubes and control cables. • Cuts and flanges large-sized, round and oval holes. • Cuts and shapes wooden forming blocks. • Shapes and forms structural members to specifications. • Repairs and replaces stressed skins and structural members with jury rigging, jigs and fixtures. • Joints metals with rivets and special fasteners. • Interprets and extracts information from aircraft drawings and engineering bulletins. • Carries out documentation of works performed.

National Technical Certificate Grade 2
In Architectural Drafting

Job Title	*Nature of Work*
* Architectural Draughtsman * Draughtsman (General) * Interior Design Draughtsman	• Drafts proposed building plans and site layout plans to appropriate scale from architect's sketches. • Prepares detailed building plans for submission to government for approval. • Inserts dimensions, types of materials and other information in building plans. • Applies material symbols and other graphical symbols to drawings, as specified in CP6. • Drafts/Enlarges constructional details for production purposes. • Drafts sanitary and plumbing layouts in building plans. • Arranges for drawings to be produced for use as production drawings by builders or contractors. • Colours building plans. • Takes site measurements. • Drafts plans for additions or alterations to buildings. • Assists in the preparation of presentation drawings. • Uses pre-printed adhesive media for presentation drawings. • Liaises with builders, contractors and relevant engineers on specific technical problems relating to building works. • Liaises with other Government Departments such as the Ministry of National Development, for the approval of building plans.

National Technical Certificate Grade 2
In Boiler/Pipe Fitting & Servicing

Job Title	*Nature of Work*
* Boiler & Pipe Insulator * General Foreman (Shipbuilding & Repairing)	• Assembles, installs, maintains, welds, repairs and tests the piping system of ships. • Makes and repairs tanks and containers made of sheet and plate steel.

- Marine Pipe Fitter
- Supervisor & General Foreman (Shipbuilding & Repairing)

- Conducts smoke detecting and pressure tests on pipes.
- Repairs outfits in engines, boiler rooms, pump rooms and tanks.
- Repairs thermal insulation on various tanks, engines, boilers and pump room equipment
- Renews and replaces boiler tubes.
- Makes necessary preparation for boiler surveys.
- Marks out pipes and cuts pipes to size, using machine or gas-cutting methods.
- Bends pipes to shapes according to specifications.
- Carries out welding on pipe-to-pipe joints and flange-to-pipe joints.

National Technical Certificate Grade 2
In Cable Jointing

Job Title

- Electric Cable Jointer
- Eelctric Power Cableman (Underground)
- Electric Power Lineman (Underground)

Nature of Work

- Organises and carries out cable jointing up to 22 kV including preparation/preliminary work.
- Reads and interprets simple schematic diagrams, circuit/wiring diagrams, cable joint blueprints and operational diagrams.
- Sets up tarpaulin tents or other shades.
- Excavates trenches for laying short lengths of cables and back-filling trenches, including supplementary excavation of joint bay to facilitate jointing.
- Carries out simple masonry work such as cementing/concreting pot-holes and brickworks on the overground boxes.
- Installs earth electrode systems and the earthing of overground boxes.
- Carries out any other associated duties necessary to complete a cable joint such as compound preparation, cable cutting and preparation of solder.
- Uses cable jointing and related tools and equipment, test instruments and equipment and maintains them in good order.
- Supervises and co-ordinates cable jointing teams as required.

- Installs and replaces fuse-units in Low Tension (LT) Boards and overground distribution boxes.
- Swings or removes temporary supplies to consumers from nearby sources.

National Technical Certificate Grade 2
In Civil/Structural Drafting

Job Title	*Nature of Work*
* Civil Engineering Draughtsman * Clerk of Works * Draughtsman (General) * Structural Engineering Draughtsman	• Drafts proposed structural plans to appropriate scales with reference to architectural plans. • Prepares structural drawings and details from engineers'/designers' sketches or other specifications for fabrication and submission for approval purposes. • Inserts dimensions, types of materials and other relevant information, showing positions, sizes and inter-relations of components. • Prepares contract drawings. • Assists in estimating quantities from contract drawings. • Arranges for drawings to be produced for use by builders or contractors. • Takes measurements from sites for amendments and completion of drawings. • Drafts structural plans for addition or alteration works. • Interprets civil/structural and building drawings and supervises work on building sites. • Liaises with engineers, such as civil, structural, electrical and mechanical engineers, on specific technical problems relating to building works. • Liaises with Government Departments such as the Ministry of Environment, the Ministry of National Development, for the approval of the structural plans.

National Technical Certificate Grade 2
In Diesel Engine Mechanics

Job Title	*Nature of Work*
* Diesel Engine Mechanic (except Motor Vehicle)	• Services and repairs wheel and crawler tractors such as bull-dozers, loaders, dump trucks, motor graders, scrappers, excavators, vibratory rollers, soil compactors, trash compactors, wheel backhoes and shovels.
* Earth Moving Equipment Mechanic	• Examines tractors to ascertain the nature, extent and location of defects.
* Industrial Machinery Mechanic	• Overhauls engines, transmissions, final drives, brake controls, steering controls, undercarriages, hydraulic systems, diesel fuel systems and electrical systems.
* Tractor Mechanic	• Determines wear in undercarriage components.
* Truck Mechanic	• Directs rebuilding processes of undercarriage components.
	• Adjusts systems and controls to meet manufacturer's specifications.
	• Diagnoses faults on tractors.
	• Remedies faults on tractors.
	• Test-drives repaired tractors.
	• Attends to field work services.
	• Liaises with foreman of clients on repairs.

National Technical Certificate Grade 2
In Electrical Distribution

Job Title	*Nature of Work*
* Electric Power Cableman (Overhead)	• Performs all electrical fittings and wiring work in connection with the construction and erection of street lighting installation.
* Electric Power Cableman (Underground)	• Maintains, inspects and performs on-the-spot diagnosis of street lighting installation faults and initiates repairs at street lighting pole heights.
* Electric Power Lineman (Underground)	• Performs overhead installation work.
* Electrical Engineering Technician (High Voltage)	• Rectifies Low Tension (LT) underground and overhead installation faults.
* Power Distribution Technician (Electricity)	• Assists the standby officers in faults investigation and restoration of power supplies.
* Power Generation Technician (Electricity)	

* Power Transmission Technician (Electricity)	• Keeps records on the types of LT fault rectification works undertaken. • Writes reports on all LT fault rectification works undertaken. • Interprets distribution cable network and circuits. • Maintains and inspects LT distribution equipment. • Maintains and inspects High Tension (HT) distribution equipment. • Assists authorised officers to carry out HT fault rectification and repairs. • Assists to write reports on HT fault rectification works undertaken.

National Technical Certificate Grade 2
In Electrical Drafting

Job Title	*Nature of Work*
*. Draughtsman (General) * Electrical Draughtsman	• Uses electrical or graphical symbols as specified in Singapore Standards SS202 or IEC 117. • Draws circuits for electrical installation systems. • Prepares electrical installation layout drawings. • Prepares single-line drawings. • Selects and arranges electric lighting systems. • Prepares emergency lighting systems and electric fire alarm systems. • Prepares motor controls and other related drawings. • Takes off materials from electrical installation drawings. • Prepares drawings on mains failure generating sets. • Prepares drawings on CATV, sound and communication systems. • Assists in preparation of electrical specifications. • Prepares lightning protective system drawings.

National Technical Certificate Grade 2
In Electrical Installation & Servicing

Job Title	*Nature of Work*
* Building Maintenance Electrician * Electrical Control Apparatus Fitter * Electrical Draughtsman * Electrical Engineering Technician (General) * Electrical Fitter (General) * Electrical Household Appliance Fitter * Electrical Household Appliance Mechanic * Electrical Products Inspector & Tester * Electrical Products Quality Checker * Electrical Switchgear & Control Apparatus Fitter * Electrician (General) * Installation Electrician (Building) * Stage & Studio Electrician * Theatre Electrician	• Produces low voltage installation layout and single-line diagrams. • Installs new electrical equipment and apparatus. • Ensures the daily normal operation of low voltage electrical installations under the supervision of engineers in industrial, commercial or residential buildings. • Inspects and maintains proper records on wiring and electrical installation equipment such as switchgears and motors. • Follows set routine preventive maintenance programmes. • Conducts routine tests on electrical installations. • Carries out pre-commissioning tests of equipment and apparatus. • Assists engineers to conduct commissioning tests of cables, switchgears and transformers. • Traces and rectifies faults in electrical systems. • Repairs and replaces defective components. • Rewires and modifies electrical installations and equipment under the supervision of engineers.

National Technical Certificate Grade 2
In Electrical Power & Machines

Job Title	*Nature of Work*
* Electric Power Cableman (Underground) * Electric Power Lineman (Underground) * Electrical Control Apparatus Fitter * Electrical Engineering Technician (General) * Electrical Fitter (General) * Electrical Household Appliance Fitter * Electrical Motor & Generator Fitter * Electrical Products Inspector & Tester	• Installs and carries out periodic maintenance and major maintenance of electrical rotating machines. • Interprets specifications to select appropriate machines and associated equipment for given applications. • Installs and maintains power transformers. • Installs and maintains electro-mechanical, electronic and pneumatic control systems. • Interprets specifications and builds control systems. • Installs, maintains and tests electrical installations.

* Electrical Products Quality Checker
* Electrical Switchgear & Control Apparatus Fitter
* Electrical Transformer Fitter
* Electrician (General)
* Electricity Generating Plant Operator (Steam)
* Industrial Machine Assembler (Electrical)
* Ship Electrician
* Vehicle Electrician

- Maintains and tests switchboards and switchgears.

National Technical Certificate Grade 2
In Electro-Mechanical Maintenance Fitting

Job Title

* Machinery Fitter (General)
* Maintenance Fitter
* Plant Maintenance Mechanic

Nature of Work

- Carries out general fitting work and adjusts mechanical and electrical parts of machines.
- Performs electrical fitting and installation work, and other related electrical work.
- Carries out maintenance and repairs of mechanical and electrical machines such as engines, battery charging equipment, switchgears, transformers and various systems connected with hydraulic, pneumatic and steam.
- Reads and interprets blueprints, circuit and wiring drawings for the machines and equipment as listed above.
- Maintains machinery and hand tools.
- Carries out installation and testing of mechanical and electrical machines at power station plant and work services or water work plant and work services or gas work plant and work services.
- Conducts preventive maintenance inspection on machinery.
- Repairs and replaces defective parts, and uses machine tools to fabricate the parts.
- Handles gas and arc welding machines in joining processes as well as for heat treatment.
- Makes simple replacement parts of machinery or related equipment using bench tools.

National Technical Certificate Grade 2
In Electro-Mechanical Servicing

Job Title	*Nature of Work*
* Automation Technician * Machinery Mechanic (General) * Mechatronics Technician * Plant Maintenance Mechanic	• Interprets electrical, electronic, pneumatic, hydraulic and mechanical system schematics. • Installs and adjusts mechanical, pneumatic, hydraulic, electrical and electronic machines or parts of machines. • Fabricates simple machine parts by using hand tools and joining processes. • Fabricates electronic circuits to perform simple interfacing or control tasks. • Installs or modifies power and low voltage electric wiring in new or existing installation. • Diagnoses faults using test equipment, on electrical, electronic, pneumatic and hydraulic systems, including micro-processor and robotic based equipment. • Installs and calibrates electric and pneumatic controllers and transmitters for the control of temperature, pressure, flow and level. • Modifies existing machines or equipment to suit changes in production processes. • Carries out corrective and preventive maintenance programmes on industrial manufacturing and production machinery.

National Technical Certificate Grade 2
In Electronics Servicing (Digital Equipment)

Job Title	*Nature of Work*
* Computer Systems Technician * Data Processing Equipment Fitter * Electronic Computer & Related Equipment Fitter * Electronics Engineering Assistant (General) * Electronics Engineering Technician (General)	• Repairs equipment incorporating digital electronics, analogue electronics and mirco-computers. • Uses test equipment (oscilloscope, logic probe, logic chip, logic pulser and logic analyzer). • Installs and tests data communication equipment (such as computer to peripheral links). • Installs and maintains interface equipment and provides protection circuitry where appropriate. • Installs electronic equipment in harsh environmental situations.

- Carries out preventive maintenance on industrial digital systems; computer and peripheral equipment.
- Programmes computer systems to carry out diagnostic operations.
- Performs modifications to overcome design faults in digital electronic equipment.

National Technical Certificate Grade 2
In Electronics Servicing (Electronics Instrumentation)

Job Title	*Nature of Work*
* Electronics Engineering Assistant * Electronics Engineering Technician (General) * Instrumentation Technician (Electronic)	• Inspects operating features of electronic instrumentation devices such as sensors, recorders, and equipment in factories, workshops, test rooms or on board ships. • Installs and commissions electronic instrumentation devices. • Adjusts and aligns electronic instruments. • Repairs and replaces components in electronic instruments. • Renews and reconnects wiring where necessary. • Diagnoses faults with the aid of test equipment. • Examines drawings and wiring diagrams. • Tests and monitors the operation of electronic instruments. • Maintains and services electronic instruments. • Performs modifications to improve operating performance of electronic instruments. • Performs routine inspections of installed electronic instrumentation systems.

National Technical Certificate Grade 2
In Electronics Servicing (Radio Communication)

Job Title	*Nature of Work*
* Radio Transmitter Fitter	• Installs and commissions radio communication equipment such as VHF Transceivers, Antenna Systems, Radio Telegraphic Equipment, Auto-Alarm Receivers, Life-Boat Radio Transceivers, Auto-Keying Devices, Emergency Lighting and Intercommunication Systems.

- Examines and interprets drawings and wiring diagrams.
- Renews and reconnects wiring where necessary.
- Aligns and adjusts radio communication equipment.
- Inspects, maintains and services radio communication equipment.
- Diagnoses and replaces faulty components in radio communication equipment.
- Diagnoses faults with the aid of test equipment.
- Tests and calibrates radio communication equipment.

National Technical Certificate Grade 2
In Electronics Servicing (Video Technology)

Job Title	*Nature of Work*
* Audio & Video Equipment Technician	• Trouble-shoots and repairs monochrome/ colour television receivers, video cassette recorders and related closed circuit TV equipment.
* Control Room Technician (Radio & Television Broadcasting)	• Installs and commissions closed circuit TV systems.
* Electronics Fitter (Radio, Television & Radar Equipment)	• Diagnoses faults in video systems.
* Radio & Television Technician	• Diagnoses and replaces faulty components.
* Sound Technician (Radio & Television Broadcasting)	• Tests, aligns and adjusts video equipment.
* Television Transmitter Mechanic	• Writes brief service reports for customers.

National Technical Certificate Grade 2
In Fashion Garment

Job Title	*Nature of Work*
* Dressmaker	• Takes measurements of customers.
* Garment Cutter	• Applies measurements of customers for the construction of block patterns.
* Garment Cutting Marker	• Makes patterns of various garment styles such as day wear, formal wear, pants and ladies' jackets.
* Garment Patternmaker	• Grades standard patterns for different sizes of garments.
* Gown Maker	• Estimates quantity of fabric required for different garments.

- Assembles garments for fitting.
- Fits basted garments on customers and marks any necessary alterations.
- Alters and corrects defects to suit customers' requirements.
- Calculates costs of garments.
- Applies fine decorative work.
- Performs draping on dress mannequins and customers.

National Technical Certificate Grade 2
In Food & Beverage Service

Job Title	*Nature of Work*
* Barman	• Takes charge of sections of coffee houses, restaurants, clubs, etc.
* Bartender	
* Captain (Catering Service)	• Supervises and co-ordinates the work of employees engaged in providing services to diners in his/her assigned section.
* Head Waiter	
* Hotel Steward	• Arranges table reservations for guests.
* Maitre d'Hotel	• Greets and escorts guests to tables.
* Railway Dining Car Waiter	• Ensures that food and services conform to company standards.
* Restaurant Captain	
* Waiter (General)	• Trains dining-room staff in all aspects of dining-room service skills.
* Wine Steward	• Takes guests' orders and passes them to waiters/ waitresses.
* Wine Waiter	• Carries out arrangements for banquets.

National Technical Certificate Grade 2
In Food Preparation

Job Title	*Nature of Work*
* Baker (General)	• Performs basic food preparation.
* Cafeteria Cook	• Prepares and cooks meats, fish, poultry, vegetables, fruits, stocks, sauces and other food products of either fresh or frozen form.
* Coffee House Cook	
* Hotel Cook	• Prepares food using various cooking techniques such as grilling, pan-frying, steaming, roasting and other methods.
* Pastry Cook (Restaurant)	
* Restaurant Cook	• Operates all basic kitchen equipment.
* Ship's Cook	

- Performs good personal and food hygiene at all times in accordance with established Food Handlers Hygiene Regulations.
- Implements correct storage temperatures and procedures for all food items (raw or cooked).
- Presents hot and cold dishes (plated or buffet style) for pick up by restaurant staff.
- Assists and supervises staff under his/her control.

National Technical Certificate Grade 2
In Front Office

Job Title	*Nature of Work*
* Hotel Receptionist	• Processes room reservations. • Checks in and checks out guests. • Maintains guest accounts. • Provides safe deposit and foreign exchange services. • Provides guest information and services. • Promotes and sells hotel rooms. • Operates the switchboard. • Operates the facsimile and teleprinter.

National Technical Certificate Grade 2
In Furniture Production

Job Title	*Nature of Work*
* Cabinet Maker * Furniture Maker (Wood) * Wooden Furniture Finisher	• Ascertains job requirements from drawings and specifications. • Draws or sketches constructional details of furniture items. • Sets woodworking machines to cut or shape wood components to specifications. • Grinds or sharpens Tungsten Carbide Tip (TCT) and High-Speed Steel (HSS) cutters and saw blades with appropriate grinding wheels. • Selects and fixes jigs, templates and appropriate cutting tools in machines, sets guides and stops as necessary. • Makes jigs or templates and/or prototypes for production runs.

- Constructs solid wood furniture, using either fully-assembled or knocked-down system.
- Fits and assembles parts to make furniture.
- Prepares cost estimates for furniture items.
- Plans layout of a machine shop.

National Technical Certificate Grade 2
In Graphic Reproduction

Job Title	*Nature of Work*
* Lithographic Printing Transferrer	• Makes ready and operates the densitometer, process camera, enlarger, contact frame and scanner to produce line, continuous tone or halftone negative or positive films.
* Lithographic Transferrer	
* Lithographic Tuscher	
* Photogravure Cameraman	• Operates and maintains the continuous tone and halftone film processors.
* Photogravure Mounter	
* Photogravure Plate Grainer	• Programmes the screening of halftone sets with the magenta screen on a camera.
* Photogravure Plate Maker	• Produces colour-corrected colour separation sets in a scanner.
* Photogravure Retoucher	
* Plate Mounter	• Mixes developing, fixing and other working solutions according to formulae.
* Printing Plate Retoucher	• Retouches films and originals to requirements.
* Stencil Plate Maker (Printing)	• Strips and combines colour sets together by means of masking and contacting.
* Stipple Artist (Lithographic)	• Plans and prepares the layout and imposition of printing jobs.
* Xerography Cameraman (Offset Printing)	• Mounts 4-colour flats in registration according to layout.
	• Produces layout proofs and pre-sensitized plates.
	• Performs corrections and quality control on flats and plates.

National Technical Certificate Grade 2
In Hairstyling

Job Title	*Nature of Work*
* Hairstylist	• Washes, rinses and dries hair, using special shampoo and solutions as necessary.
* Ladies' Hairdresser	• Performs colour drying.
	• Cuts hair according to clients' instructions or to a particular style.

- Perms and waves hair.
- Services wigs.
- Analyses hair/scalp disorders and performs remedial treatments.
- Bleaches, dyes or tints hair.

National Technical Certificate Grade 2
In Jewellery Making

Job Title	*Nature of Work*
* Gem Setter	• Interprets complex designs and mechanical drawings of jewellery articles such as rings, pendants, necklaces, bracelets, chains, brooches and links with hinges.
* General Foreman (Jewellery Manufacturing)	• Packs, vulcanizes, cuts and injects complex rubber moulds.
* Goldsmith	• Carves, shapes and moulds wax into elaborate designs.
* Jeweller (General)	• Performs casting of complex and intricate jewellery articles.
* Jewellery Repairer	• Performs alloying of precious metal and shapes them into various forms to create components for fabrication.
* Jewellery Worker (General)	• Fabricates and assembles precious metal components into complex jewellery articles.
* Silversmith	• Repairs and renovates complex jewellery articles.
* Supervisor & General Foreman (Jewellery Manufacturing)	• Smooths, polishes and electro-plates the jewellery surface.
	• Performs complicated stone setting in jewellery articles.
	• Inspects and rectifies defects in finished articles of jewellery.

National Technical Certificate Grade 2
In Lift & Escalator Mechanics

Job Title	*Nature of Work*
* Electrical Elevator & Related Equipment Fitter	• Installs low-rise and high-rise lift systems.
* Electrical Lift Fitter	• Repairs and maintains lift systems incorporating electro-mechanical, electronic and micro-computer controls.
* Escalator Fitter	

- Inspects and adjusts the essential components of lift systems.
- Tests and rectifies faults in lift systems.
- Performs modifications to improve the performance and safety of lift control systems.
- Installs escalator systems.
- Repairs and maintains escalator systems.
- Inspects and adjusts the essential components of escalator systems.
- Tests and rectifies faults in escalator systems.
- Performs modifications to improve the performance and safety of escalator systems.
- Interprets circuit diagrams of lift escalator controls.

National Technical Certificate Grade 2 In Marine Mechanics

Job Title

* Diesel Engine Mechanic (except Motor Vehicle)
* Industrial Machinery Mechanic
* Internal Combustion Engine Fitter
* Machinery Mechanic (General)
* Marine Engine Fitter
* Marine Engineering Technician
* Ship's Engine-Room Mechanic
* Turbine Fitter-Assembler

Nature of Work

- Dismantles, fits and adjusts components and reassembles main propulsion diesel engine/steam turbines including auxiliary diesel engine.
- Overhauls auxiliary diesel engines, pumps, valves and air compressors.
- Disassembles, fits and reassembles ship propellers, propeller shaftings, stern-tube seals and bearings, plummer blocks and thrust blocks.
- Aligns, fits and adjusts drive shaft bearings and couplings.
- Services steering gears and control systems.
- Disassembles, fits components and reassembles deck machinery such as mooring capstan, cargo winch, tow winch, windlass, cranes and cargo gear.
- Services steam boiler mountings and pressure vessel mountings.
- Uses precision instruments such as micrometers, dial test indicators, bore gauges, depth gauges, surface gauges etc, to check measurements and alignment of component parts.
- Repairs defects in component parts.
- Carries out performance test of engines and other auxiliary machinery.

National Technical Certificate Grade 2
In Marine Steelwork

Job Title	*Nature of Work*
* Flame Cutter * General Foreman (Shipbuilding & Repairing) * Metal Shipwright * Ship Plater * Structural Steel Erector	• Ascertains job requirements from marine engineering drawings or other specifications for the repairs or construction of ships, oil rigs and marine structures. • Erects and fairs ship framework or prefabricated hull sections. • Marks out metal plate or girders ready for cutting and shaping. • Prepares and positions ship and metal platework ready for welding, riveting or bolting. • Bends metal girders to form framework of ship. • Tack-welds metal parts together temporarily, ready for full welding operation. • Cuts, trims and shapes metal by manually applying a gas flame and oxygen jet or an electric arc. • Operates machine to cut, trim and shape metal by the melting action of a gas flame and an oxygen jet. • Prepares and conducts inspection and tests on hull sections. • Performs simple shielded metal-arc welding. • Installs fittings such as davits, hatch covers and winches.

National Technical Certificate Grade 2
In Mechanical Drafting

Job Title	*Nature of Work*
* Draughtsman (General) * Mechanical Draughtsman * Ventilation Systems Draughtsman	• Interprets engineer's or designer's sketches, notes and specifications and makes necessary adjustments to and supportive calculations of dimensions. • Collects data on site to prepare working drawings. • Prepares accurate working drawings from sketches, notes and specifications for the manufacture of simple machines, mechanical units and systems including welded fabrication and structural steelwork, hydraulic and pneumatic systems.

- Prepares detailed working drawings of engineering components, showing exact dimensions, tolerances, finishes, materials and all other necessary information for production.
- Prepares piping drawings for process or refinery plants and marine piping applications, including detailed drawings of pipe supports and structural steelwork, mechanical equipment and pumps, and pressure vessels.
- Prepares working drawings for mechanical services in buildings such as air-conditioning duct work and other allied piping layouts, fire protection, drainage, domestic water supply, sanitary systems and other related pipework.
- Modifies drawings according to instructions.

National Technical Certificate Grade 2
In Mechanical Servicing (General)

Job Title	*Nature of Work*
* Machinery Fitter (General) * Machinery Mechanic (General) * Maintenance Fitter * Mechanical Engineering Technician (General) * Metalworking Machine Tool Fitter * Industrial Machinery Fitter * Industrial Machinery Mechanic	• Services and repairs various types of machinery, and related equipment (except electrical components). • Examines faulty machinery and related equipment to ascertain nature and location of defects. • Dismantles equipment, wholly or partly, to remove damaged or worn parts. • Repairs or replaces defective parts, assembles parts, does supplementary tooling as necessary to ensure accurate fit. • Tests reassembled equipment and makes necessary adjustments. • Checks and adjusts machine parts for wear, misalignment and blacklash. • Lubricates machines and related equipment. • Makes simple replacement parts of machinery or related equipment, using bench tools and/or machine tools. • Tempers and hardens metal parts. • Brazes and welds joints and fractures in the course of repair work. • Erects and installs, at the place of use, machinery and other equipment.

- Conducts preventive maintenance inspection on machinery.

National Technical Certificate Grade 2
In Men's Tailoring

Job Title	*Nature of Work*
* Tailor's Cutter	• Takes measurements of customers for size.
* Tailor (Made-to-Measure Garment)	• Makes patterns of various garment styles such as shirts, trousers, waist coats and jackets.
* Tailor (Ready-to-Wear Garment)	• Manipulates standard patterns in accordance with customers' figuration and requirements.
	• Drafts patterns on materials and cuts them out, based on fashion plates or according to customers' measurements and requirements.
	• Assembles garments for fitting.
	• Fits basted garment on customers and marks necessary alterations.
	• Alters and corrects defects on garments to suit customers' requirements.
	• Sews parts permanently together by hand and machine, and finishes the garments.
	• Makes one type or part of a garment, or alters clothing as required.

National Technical Certificate Grade 2
In Motor Vehicle Mechanics

Job Title	*Nature of Work*
* Automotive Engineering Assistant	• Services light vehicles such as cars, vans, jeeps and light goods vehicles.
* Automotive Engineering Technician	• Examines light vehicles to ascertain nature, extent and location of defects.
* Motor Vehicle Mechanic (Automobile)	• Overhauls engines, transmissions, final drives, brakes, control gears and suspension units.
* Motor Vehicle Sales Representative	• Replaces parts such as pistons, bearings, breaker points, spark plugs and accessories.
* Vehicle Engine Tuner	• Services coil and electronic ignition systems.
* Workshop Mechanic (Automobile)	• Operates engine analyzers to trace engine faults.
	• Tests repaired vehicles in workshops or on roads.
	• Performs minor electrical fitting work.

- Assesses road-worthiness of light vehicles.
- Fabricates simple brackets for repair work.
- Diagnoses vehicle faults, using common diagnostic equipment.
- Plans work using charts and technical manuals.
- Assesses costs of repairs.

Graduates who successfully complete the Motor Vehicle Inspection course conducted by VICOM or SAETC are awarded the Certificate of Endorsement.

Job Title	*Nature of Work*
* Vehicle Inspector (Government)	• Checks vehicle records for periodic inspection. • Examines conditions and effectiveness of vehicle tyres and wheels. • Examines conditions and effectiveness of vehicle suspension systems. • Inspects the roadworthy condition of steering system. • Checks wheel alignment of vehicle. • Examines conditions and effectiveness of vehicle braking systems. • Checks conditions of vehicle lighting and electrical systems. • Inspects the roadworthy condition of chassis and corrosion. • Examines conditions of fuels and exhaust systems. • Takes automotive emission readings. • Checks for any illegal modification parts. • Performs conformity checks on items stipulated by the Registry of Vehicles. • Explains to vehicle owners the defects inspected. • Prepares vehicle inspection report.

National Technical Certificate Grade 2
In Motor Vehicle Mechanics (Heavy Vehicles)

Job Title	*Nature of Work*
* Automotive Engineering Assistant	• Services heavy vehicles such as buses, lorries, trucks and heavy goods vehicles.
* Automotive Engineering Technician	• Examines heavy vehicles to ascertain nature, extent and location of faults.
* Motor Bus Mechanic	• Overhauls engines, transmissions, final drives, brakes, control gears and suspensions.
* Motor Lorry Mechanic	• Replaces parts such as pistons, bearings, fuel injectors, fuel injection pumps and accessories.
* Motor Mechanic (General)	• Operates engine analyzers to trace engine faults.
* Motor Truck Mechanic	• Tests repaired vehicles in workshops or on roads.
* Vehicle Engine Tuner	• Performs minor electrical fitting work.
* Workshop Mechanic (Automobile)	• Assesses road-worthiness of heavy vehicles.
	• Fabricates simple brackets for repair work.
	• Diagnoses vehicle faults, using common diagnostic equipment.
	• Plans work using charts and technical manual.
	• Assesses costs of repairs.

National Technical Certificate Grade 2
In Offset Printing

Job Title	*Nature of Work*
* General Foreman (Printing & Publishing)	• Makes ready and operates a single colour, two-colour or multi-colour sheet fed offset press to print a range of jobs from one-colour to multi-colour on sheets of paper, metal and other materials.
* Layer-On, Printing Press	• Packs printing cylinders with correct amount of packing sheets and adjusts the pressure between them prior to the positioning and fixing of the plates around the cylinders.
* Lithographic Pressman	• Adjusts both inking and dampening rollers and sets the controls for the correct supply of ink and moisture to rollers.
* Offset Pressman	• Loads or directs loading of press with paper or other materials to be printed and sets and adjusts controls of the feeding mechanism.
* Printing Machine Operator	• Sets the delivery unit and adjusts the spray powder mechanism to prevent smudging or set-off.
* Printing Pressman	

- Sets ink duct and makes a trial run.
- Uses densitometer to check the quality of the print, examines proof and makes adjustments to bring print to required standard.
- Identifies printing faults and makes appropriate remedies.
- Starts printing run and maintains consistency of print quality.
- Washes up, preserves plates and maintains press in proper working condition.
- Observes safety regulation and rules.

National Technical Certificate Grade 2
In Precision Machine Fitting (Machine Tool)

Job Title	*Nature of Work*
* Machinery Fitter-Assembler (General) * Metalworking Machine Tool Fitter-Assembler	• Fits and assembles parts in the manufacture of metal-working machine tools such as boring, milling and precision grinding machines, lathes and related equipment. • Fits and assembles sub-assemblies to make various types of secondary sub-assemblies. • Ascertains job requirements from drawings or other specifications. • Determines sequences and methods of required operations. • Checks prepared metal parts for accuracy of machining or sub-assemblies for accuracy of fits, using measuring instruments. • Adjusts sub-assemblies using hand tools such as files, laps, reamers, scrapers, spanners and taps to ensure correct fit. • Checks alignments during assembly using dial gauges, height gauges, verniers, micrometers and other measuring instruments. • Joins parts by brazing, riveting, soldering or welding. • Inspects and runs tests on the machines.

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National Technical Certificate Grade 2
In Precision Machining

Job Title

* Auto-Lathe Setter-Operator
* Boring Machine Setter-Operator (Metalworking)
* Drilling Machine Setter-Operator (Metalworking)
* Gear Cutting Machine Setter-Operator (Metalworking)
* Metal Boring Machine Setter-Operator
* Metal Grinding Machine Setter
* Metalworking Lathe Setter-Operator
* Metalworking Machine Setter (General)
* Milling Machine Setter-Operator (Metalworking)
* Numerical Control Machine Setter-Operator (Metalworking)
* Precision Grinding Machine Setter (Metalworking)
* Precision Grinding Machine Setter-Operator
* Screw Cutting Machine Setter-Operator (Metalworking)
* Turner

Nature of Work

- Sets up and operates metal cutting machines such as lathes, milling machines, boring machines, grinding machines and drilling machines to cut workpieces to fine tolerances.
- Ascertains job requirements from drawings and/or other specifications.
- Determines sequences and methods of required operations.
- Selects and fixes appropriate cutting tools.
- Positions and secures workpieces on machines, using jigs, shims, bolts, clamps and other positioning aids and fixing devices.
- Sets machine controls for rotation speeds, depths of cut, etc.
- Adjusts machine table stops and guides.
- Operates automatic or manual controls to feed cutting tools.
- Checks accuracy of machining using measuring instruments.
- Repositions workpieces, changes tools and resets machines as necessary.
- Marks workpieces prior to machining.
- Sharpens cutting tools.

National Technical Certificate Grade 2
In Precision Machining (Grinder)

Job Title

* Precision Grinding Machine Setter (Metalworking)
* Precision Grinding Machine Setter-Operator

Nature of Work

- Sets up and operates precision grinding machines to grind workpieces to fine tolerances.
- Ascertains job requirements from drawings and/or other specifications.
- Determines sequences and methods of required operations.
- Selects and fixes appropriate grinding wheels.

- Positions and secures workpieces on machines, using magnetic chucks, jigs, shims, bolts, clamps and other positioning aids and fixing devices.
- Sets machine controls for rotation speeds, feed rates, depths of cut, etc.
- Adjusts machine table stops and guides.
- Operates automatic or manual controls to feed a grinding wheel.
- Checks accuracy of machining using precision measuring instruments.
- Repositions workpieces, changes tools and resets machines as necessary.
- Dresses grinding wheels to a required profile.

National Technical Certificate Grade 2
In Precision Machining (Lathe)

Job Title	*Nature of Work*
* Auto-Lathe Setter-Operator * Lathe Setter-Operator * Metalworking Lathe Setter-Operator * Metalworking Machine Setter-Operator (General) * Turner	• Sets up and operates lathes to machine workpieces to fine tolerances. • Ascertains job requirements from drawings and/or other specifications. • Determines sequences and methods of required operations. • Selects and fixes appropriate lathe cutting tools. • Positions and secures workpieces on machines, using chucks, face-plates, jigs, shims, bolts, clamps and other positioning aids and fixing devices. • Sets machine controls for rotation speed, depth of cut, etc. • Adjusts machine table stops and guides. • Operates automatic or manual controls to feed lathe cutting tools. • Checks accuracy of machining using precision measuring instruments. • Repositions workpieces, changes tools and resets machines as necessary. • Marks workpieces prior to machining. • Sharpens lathe cutting tools.

National Technical Certificate Grade 2
In Precision Machining (Miller)

Job Title	*Nature of Work*
* Milling Machine Setter-Operator (Metalworking) * Gear Cutting Machine Setter-Operator (Metalworking) * Screw Cutting Machine Setter-Operator (Metalworking)	• Sets up and operates milling machines to cut workpieces to fine tolerances. • Ascertains job requirements from drawings and/or other specifications. • Determines sequences and methods of required operations. • Selects and fixes appropriate milling cutters. • Positions and secures workpieces on machines, using jigs, shims, bolts, clamps and other positioning aids and fixing devices. • Sets machine controls for rotation speeds, feed rates, depths of cut, etc. • Adjusts machine table stops and guides. • Operates automatic or manual controls to feed cutting tools. • Checks accuracy of machining using precision measuring instruments. • Repositions workpieces, changes tools and resets machines as necessary. • Marks workpieces prior to machining. • Sharpens milling cutters.

National Technical Certificate Grade 2
In Precision Optics

Job Title	*Nature of Work*
* Lens Grinding Machine Operator * Lens Polishing Machine Operator * Optical Glass Slicer	• Sets up and operates glass working machines such as milling machines, curve-generating machines, diamond smoothing machines, loose-abrasive grinding machines, centring and edging machines, slicing machines, core-drilling machines and polishing machines to process lenses, prisms, wedges and windows to fine tolerances. • Ascertains job requirements from drawings and/or other specifications. • Determines sequences and methods of required operations.

- Positions and secures workpieces on machines, using jigs, clamps, cements and other fixing devices.
- Checks accuracy of workpieces using measuring instruments including collimators, goniometers and interferometers.
- Measures refractive indices and dispersive powers of optical materials using refractometers.
- Performs fine-cementing of optical components using thermo-setting and thermo-plastic optical cements.
- Manually fabricates test-glass of precision-grade to match radii of curvatures.

National Technical Certificate Grade 2
In Precision Tooling (Injection Mould)

Job Title	*Nature of Work*
* Die Sinking Machine Setter-Operator (Metalworking) * Tool & Die Maker	• Fits and assembles parts to make and set injection moulds, jigs, fixtures, gauges and templates. • Reads and interprets drawings, models, templates and other specifications. • Computes dimensions and plans layout and assembly operations. • Measures and marks metal stock for machining. • Measures mould parts using co-ordinate measuring machine. • Sets and operates machine tools such as lathes, milling machines, grinding machines, jig grinders, jig borers, EDM, CNC machining centres, CNC EDM and CNC wire-cut EDM. • Assembles parts and verifies dimensions, alignments and clearances, using dial indicators, gauge blocks, thickness gauges and micrometers. • Repairs, modifies or replaces mould components. • Heat-treats mould components. • Brazes or welds mould parts. • Polishes cavities and cores of moulds. • Designs moulds, jigs and fixtures.

National Technical Certificate Grade 2
In Precision Tooling (Press Tool)

Job Title	*Nature of Work*
* Die Finisher * Die Sinking Machine Setter-Operator (Metalworking) * Jig & Gauge Maker * Tool & Die Maker	• Fits and assembles parts to make and set press tools (such as forming, bending, progressive and trimming tools), jigs, fixtures, gauges and templates. • Reads and interprets drawings, models, templates and other specifications. • Computes dimensions and plans layout and assembly operations. • Measures and marks metal stock for machining. • Measures press tool parts using co-ordinate measuring machine. • Sets and operates machine tools such as lathes, milling machines, grinding machines, jig grinders, jig borers, EDM machines, CNC machining centres, CNC EDM and CNC wire-cut machines. • Assembles parts and verifies dimensions, alignments and clearances, using dial indicators, gauge blocks, thickness gauges and micrometers. • Heat-treats press tool parts. • Dismantles worn or defective tools, dies and fixtures. • Repairs, modifies or replaces press tool parts. • Brazes or welds press tool parts.. • Designs tools, jigs and fixtures.

National Technical Certificate Grade 2
In Process Operation & Control

Job Title	*Nature of Work*
* Chemical Engineering Assistant (General) * Chemical Engineering Assistant (Petroleum) * Chemical Engineering Technician (General) * Chemical Engineering Technician (Petroleum)	• Operates and maintains process equipment. • Controls the operating conditions of process equipment. • Isolates process equipment from chemicals and gases for maintenance. • Performs product handling and transportation. • Conducts chemical and physical tests on process variables for quality control.

* Petroleum Refining Technician	• Performs start-up, shut-down and emergency shut-down of process plants. • Treats effluent industrial waste. • Conducts fire fighting and control.

National Technical Certificate Grade 2
In Sheetmetal Fabrication

Job Title	*Nature of Work*
* Furniture Assembler (Sheetmetal) * Metal Products Assembler * Sheetmetal Marker * Sheetmetal Worker (General)	• Makes a wide range of products for domestic, commercial and industrial applications, using steel, galvanised steel, copper, aluminium and stainless steel sheets, up to 3 mm thick. • Marks out sheets by applying geometrical methods of pattern development. • Cuts sheets/patterns, using various machines and hand tools. • Bends metal sheets on sheetmetal bending machines. • Forms sheetmetal into various shapes by hand or with the help of bending and rolling machines. • Welds sheetmetal, using gas or arc welding equipment. • Solders self-secured and other types of joints by hand. • Joins sheetmetal, using resistance welding machines. • Fastens sheetmetal joints by solid/tubular rivets. • Fabricates various air-conditioning ducts and duct fittings.

National Technical Certificate Grade 2
In Tool & Die Making (General)

Job Title	*Nature of Work*
* Die Finisher * Die Sinking Machine Setter-Operator (Metalworking) * Jig & Gauge Maker * Lathe Setter-Operator * Milling Machine Setter-Operator (Metalworking)	• Fits and assembles parts to make and set injection moulds, press tools, jigs, fixtures, gauges and templates. • Reads and interprets drawings, models, templates and other specifications. • Computes dimensions and plans layout and assembly operations.

* Numerical Control Machine Setter-Operator (Metalworking)	• Measures and marks metal stock for machining.
* Precision Grinding Machine Setter-Operator	• Measures press tool parts using co-ordinate measuring machine.
* Toolsmith	• Sets and operates machine tools such as lathes, milling machines, grinding machines, jig grinders, jig borers, EDM, CNC machining centres, CNC EDM and CNC wire-cut EDM.
	• Assembles parts and verifies dimensions, alignments and clearances using dial indicators, gauge blocks, thickness gauges and micrometers.
	• Heat-treats tools or mould components.
	• Repairs, modifies or replaces tools or mould components.
	• Polishes cavities and cores of moulds.
	• Brazes or welds press tool parts.
	• Designs tools, moulds, jigs and fixtures.

National Technical Certificate Grade 2
In Welding

Job Title	*Nature of Work*
* Flame Cutter	• Ascertains job requirements, sequences and procedures for the preparation of metals and production of welds from drawings or other specifications.
* Welder	• Applies metal-arc welding processes which include shielded metal-arc, gas metal-arc, gas tungsten-arc, submerged-arc and gravity welding to produce weldments up to internationally accepted code specifications such as Lloyd's and ASME.
	• Selects and operates appropriate welding equipment such as cutting torches, portable arc welding equipment, semi-automatic or automatic machines.
	• Positions and secures parts to be welded, using jigs and fixtures as necessary.
	• Cuts, trims and shapes metal by manually applying the gas-cutting torch, the arc-cutting electrode or the arc-air gouging equipment.
	• Operates a machine to cut, trim and shape metal by the melting action of a gas flame and an oxygen jet.
	• Cleans and smooths welds.
	• Examines welds visually.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE NATIONAL TECHNICAL CERTIFICATE GRADE 3

National Technical Certificate Grade 3 In Air-Conditioning & Refrigeration

Job Title	*Nature of Work*
* Air-Conditioning & Refrigerating Equipment Installer * Air-Conditioning & Refrigerating Equipment Mechanic * Refrigeration Equipment Erector	• Carries out routine maintenance of air-conditioning plant and machinery. • Undertakes adjustments of systems and components under the supervision of a senior mechanic. • Fabricates refrigeration systems. • Installs, checks and repairs small air-conditioning and refrigeration equipment. • Diagnoses and repairs faults in air-conditioning and refrigeration equipment. • Interprets simple electrical circuit diagrams.

National Technical Certificate Grade 3 In Aircraft Mechanics (Airframe & Engines)

Job Title	*Nature of Work*
* Aircraft Engine Mechanic * Aircraft Pipe and Tube Fitter * Hydraulic Systems Mechanic (Aircraft) * Service Mechanic (Aircraft Engine)	• Works under supervision in the hangar or line sector and where applicable in accordance with approved servicing, maintenance manuals and technical instructions. • Checks and rectifies minor defects on aircraft systems according to the information specified in the defects report from. • Removes and replaces worn and defective parts. • Removes and installs aircraft parts and components. • Assists in carrying out functional checks on aircraft systems. • Assists in assembly and disassembly of airframe and related parts. • Removes and treats corroded surfaces. • Performs housekeeping. • Maintains tools and equipment in serviceable condition. • Demonstrates work to apprentices.

- Cleans aircraft.
- Performs paints stripping.
- Maintains ground support equipment.

National Technical Certificate Grade 3
In Aircraft Mechanics (Sheetmetal)

Job Title	*Nature of Work*
* Aircraft Pipe and Tube Fitter	• Selects aircraft sheetmetal and rivets.
* Aircraft Sheetmetal Worker	• Forms specific sections of aircraft.
* Panel Beater (Aircraft)	• Finishes holes for lightening and access.
	• Removes and installs aircraft fasteners.
	• Repairs corroded aircraft surfaces and structures.
	• Fabricates aircraft parts according to specifications
	• Interprets and extracts information from aircraft drawing and engineering bulletins.
	• Carries out documentation of works performed.

National Technical Certificate Grade 3
In Arc Welding

Job Title	*Nature of Work*
* Metal Cutter (Flame)	• Marks out simple drawings on plates according to blueprints and other specifications prior to welding.
* Welder	• Selects welding electrodes, connects welding cables to workpiece and regulates current for welding.
	• Cleans and prepares plate edges by means of oxy-acetylene equipment where necessary.
	• Welds mild steel plates in various positions by the shielded metal-arc welding process.

National Technical Certificate Grade 3
In Boiler/Pipe Fitting & Servicing

Job Title	*Nature of Work*
* Boiler and Pipe Insulator	• Dismantles, cleans and reassembles main and auxiliary boilers and their accessories, exhaust gas, economizers and pressure vessels.
* Marine Pipe Fitter	

- Replaces outfits in engines, boiler pump rooms and tanks.
- Replaces thermal insulation work on various tanks equipment in engines, boilers, pump rooms and tanks.
- Replaces bricks in a boiler.
- Assembles, installs, maintains and repairs piping systems of ships.
- Plans layout of pipe assemblies to be installed and makes wire templates.
- Prepares pipes and assembles them according to templates.
- Connects piping to tanks, boilers, pumps and other appliances and fixtures.

National Technical Certificate Grade 3
In Building Drafting

Job Title	*Nature of Work*
* Architectural Draughtsman * Draughtsman (General)	• Uses drafting instruments to produce architectural drawings, constructional drawings, tracing work, and production and printing of building drawings. • Applies free hand lettering, stencilling, dimensioning, symbols and abbreviations in preparing building plans. • Prepares working drawings and detailed drawings from sketches of buildings from foundation to roof. • Interprets building services drawings such as electrical, sanitary, air-conditioning etc. • Prepares simple reinforced concrete structural drawings from the designer's sketches.

National Technical Certificate Grade 3
In Building Servicing

Job Title	*Nature of Work*
* Building Maintenance Electrician * Building Maintenance Worker	• Repairs and maintains physical structures of commercial and industrial establishments such as office buildings, shopping complexes, apartments, hotels, hospitals, schools and factory buildings. • Paints structures.

- Performs minor tiling, plastering, concreting and bricklaying work.
- Repairs plumbing and sanitary fixtures.
- Erects temporary partitions.
- Makes minor repairs to simple mechanical equipment.
- Repairs, fabricates and installs simple metal structures.
- Replaces defective electrical switches and other fixtures.
- Diagnoses simple faults in lighting circuits, electrical appliances and motors.
- Services room air-conditioner units.
- Carries out routine maintenance of air-conditioning and refrigeration plants.
- Carries out rescue operations in lifts and escalators.
- Repairs and installs carpentry and joinery works.

National Technical Certificate Grade 3
In Cable Jointing

Job Title	*Nature of Work*
* Cable Jointer (Electric Cable)	• Organises and carries out LV cable jointing work on dead or live systems including preparation/ preliminary work. • Reads and interprets simple mechanical and electrical drawings, LV cable joint blueprints and operational diagrams. • Sets up tarpaulin tents or other shades. • Excavates trenches for laying short lengths of cables and back-filling trenches, including supplementary excavation of joint bays to facilitate jointing. • Carries out simple masonry work such as cementing/concreting pot-holes and brick-works on overground boxes. • Installs earth electrode systems and the earthing of overground boxes. • Carries out any other associated duties necessary to complete a cable joint such as compound preparation, cable cutting and preparation of solder.

71

- Uses simple and hand tools, LV cable jointing and related tools and equipment, test instruments and equipment and maintains them in good order.
- Swings or removes temporary supplies to consumers from nearby sources.

National Technical Certificate Grade 3
In Diesel Engine Mechanics

Job Title	*Nature of Work*
* Diesel Engine Mechanic	• Operates, services and maintains diesel engines.
* Earth Moving Equipment Mechanic	• Services fuel systems of diesel engines.
* Tractor Mechanic	• Services heavy duty hydraulically-operated equipment and auto-electrical equipment.
	• Services heavy duty power trains and control units.
	• Diagnoses simple faults in engines, and transmissions and control units.
	• Fabricates simple metal brackets.

National Technical Certificate Grade 3
In Electrical Installation & Servicing

Job Title	*Nature of Work*
* Building Maintenance Electrician	• Connects up a flexible cord to a plug and appliance connector.
* Electrical Fitter (General)	• Installs pvc trunking installations of various controls of lighting circuits and socket outlet power circuits incorporating a consumer unit or distribution board.
* Electrical Fitter (Household Appliance)	• Installs steel conduit installations of lighting and power circuits incorporating a distribution board.
* Electrical Household Appliance Mechanic	• Installs steel trunking and conduit installations of direct-on-line and forward-reverse starters for a 3-phase induction motor incorporating a 3-phase isolator and remote controls.
* Electrical Installation Sub-Contractor	• Connects up instruments in electrical circuits to measure dc and ac voltages, currents and power.
* Electrician (General)	• Repairs and tests portable electrical appliances.
* Installation Electrician (Building)	• Maintains and repairs electrical motors.
	• Interprets and connects up simple motor control circuits.

- Assists the technician/supervisor in tracing faults and conducting tests on an installation/ equipment.
- Applies safety precautions at all times and installs wiring in accordance with the Code of Practice, Wiring of Electrical Equipment of Buildings and other statutory regulations.

National Technical Certificate Grade 3
In Electro-Mechanical Servicing

Job Title	*Nature of Work*
* Automation Mechanic * Mechatronics Technician	• Uses securing and fixing components for mechanical fitting work. • Fabricates metal parts to specifications from working drawings. • Performs routine maintenance such as simple servicing and adjustment or alignment of mechanical systems, basic pneumatic and hydraulic circuits. • Carries out installation of lighting, power and motor circuits. • Maintains electrical installations. • Checks, replaces and tests electronic components. • Constructs simple electronic gadgets.

National Technical Certificate Grade 3
In Electronics Servicing

Job Title	*Nature of Work*
* Electronic Fitter (General) * Electronic Products Quality Checker	• Fits, adjusts and repairs electronic apparatus in factories, workshops or places of use. • Replaces faulty parts, fits parts together and/or mounts them on chassis or panels. • Connects and solders wires together where necessary. • Tests, calibrates and adjusts domestic and industrial electronic equipment under the supervision of a foreman or engineering assistant.

National Technical Certificate Grade 3
In Fashion Garment

Job Title	*Nature of Work*
* Dressmaker	• Prepares materials and cuts materials according to the patterns. • Operates various sewing machines and attachments. • Sews ladies' skirts, blouses, dresses, casual wear and children's garments. • Performs fitting of garments on customers. • Makes necessary alterations to garments.

National Technical Certificate Grade 3
In Food & Beverage Service

Job Title	*Nature of Work*
* Bartender * Waiter (General) * Waiter (Wine)	• Arranges, sets up and serves guest tables. • Cleans and sets up service equipment in the assigned station. • Keeps sideboards, pantry and display counter stocked and clean. • Provides information on all food and beverage items offered on menu, including basic kitchen techniques, tableside food preparation, proper garnishes, ingredients and pronunciation of all menu items. • Serves all types of food and beverage offered on the menu using the correct techniques. • May present guests with alcoholic beverage/wine lists. • May advise guests on beverage/wine selection and serve them according to the establishment prescribed standards. • May provide information on the different beverages/wine characteristics. • May provide information on the various vintages of international wines. • May practise wine decanting procedures.

National Technical Certificate Grade 3
In Food Production

Job Title	*Nature of Work*
* Baker (General) * Cafeteria Cook * Coffee House Cook * Hotel Cook * Pastry Cook (Restaurant) * Restaurant Cook * Ship's Cook	• Prepares, seasons and cooks soups, meat, vegetables, desserts and other foodstuff for consumption in hotels, restaurants, clubs, schools, cafeterias and other food establishments. • Fries, broils, roasts and steams or boils meat, fish, vegetables or other food. • Cleans up food preparation areas.

National Technical Certificate Grade 3
In Food Preparation (Chinese Cuisine)

Job Title	*Nature of Work*
* Cafeteria Cook * Coffee House Cook * Hotel cook * Restaurant Cook * Ship's Cook	• Prepares sauces, stocks, soups, vegetables, meat and other foodstuff for cooking. • Cooks meats and poultry by steaming, boiling, stewing, grilling, roasting, stir-frying or deep frying. • Cooks fish and seafood by various methods. • Cooks rice and different types of noodle-dishes. • Prepares plain pastries and stuffed pastries. • Prepares salads, sandwiches, cakes, fruit juices and other cold food.

National Technical Certificate Grade 3
In Furniture Production

Job Title	*Nature of Work*
* Cabinet Maker * Furniture Maker * Woodworking Machine Setter-Operator (General)	• Sets up and operates woodworking machines such as circular saws, surface planers, thicknessers, bandsaws, mortising machines, tenoning machines, boring and drilling machines and wood turning lathes. • Cleans and lubricates woodworking machines. • Prepares timber to size from cutting lists. • Marks out workpieces from simple working drawings. • Makes simple wooden furniture, using hand tools and portable power tools.

- Repairs simple wooden furniture, using hand tools and portable power tools.
- Fixes common fixtures and fittings for furniture.
- Applies simple finishing and polishing to wood articles.

National Technical Certificate Grade 3
In General Welding

Job Title	*Nature of Work*
* Metal Cutter (Flame) * Welder	• Marks out simple drawing on plates according to blueprints and other specifications, prior to welding. • Selects welding electrodes, connects welding cables to workpieces and regulates current for welding. • Cleans and prepares plate edges by means of oxy-acetylene equipment where necessary. • Welds mild steel plates in various positions by the shielded metal-arc welding process. • Performs gas welding and brazing work on mild steel.

National Technical Certificate Grade 3
In Graphic Reproduction

Job Title	*Nature of Work*
* Proof-Pressman * Other Photographic Products Machine Operator	• Operates the process camera to produce good line and halftone negatives. • Mixes process chemicals correctly. • Processes line and halftone negatives using correct techniques. • Evaluates and makes necessary adjustments and corrections to obtain good line and halftone negatives. • Selects the correct exposure time for making negatives. • Draws layouts for film stripping. • Strips negative and positive flats. • Crops film images. • Makes proof and film contacts. • Processes and evaluates contact films.

- Prepares bookwork dummies and imposition of jobs.
- Makes pre-sensitised negative and positive plates.

National Technical Certificate Grade 3
In Hairstyling

Job Title	*Nature of Work*
* Hairstylist * Ladies' Hairdresser * Men's Hairdresser	• Prepares clients for shampooing. • Performs shampooing, scalp massaging, rinsing, conditioning and blow-drying. • Cuts hair to different styles. • Perms hair. • Colours/tints hair.

National Technical Certificate Grade 3
In Jewellery Making

Job Title	*Nature of Work*
* Gem Setter * Goldsmith * Jeweller (General) * Jewellery Repairer * Silversmith	• Interprets designs and mechanical drawings of simple jewellery articles such as basic rings, bracelets and pendants. • Packs, vulcanizes, cuts and injects rubber moulds. • Carves, shapes and moulds wax to create models of simple jewellery. • Performs casting of simple jewellery articles. • Melts precious metals into various forms and shapes them into basic jewellery by fabrication and soldering. • Repairs and renovates simple jewellery. • Smooths, polishes and electro-plates the jewellery surface. • Performs basic stone setting in articles of jewellery. • Inspects and rectifies defects in finished articles of simple jewellery.

National Technical Certificate Grade 3
In Lift & Escalator Mechanics

Job Title	*Nature of Work*
* Electrical Lift Fitter * Escalator Fitter	• Fits, adjusts, services and repairs both mechanical and electrical parts of lifts, escalators and related equipment in factories, workshops or premises. • Reads simple blueprints. • Interprets simple lift wiring diagrams. • Works in accordance with SISIR Lift and Escalator Codes. Works mainly on AC low-speed lifts.

National Technical Certificate Grade 3
In Marine Mechanics

Job Title	*Nature of Work*
* Diesel Engine Mechanic * Engine Room Mechanic (Ship) * Marine Engine Fitter	• Interprets blueprints to carry out repairs and service work. • Dismantles, inspects and refits parts and reassembles marine diesel engines, winches, steering systems and other equipment on board ships. • Checks accuracy of components and fits between parts. • Services and repairs marine diesel engine components and systems, marine deck and hull machinery, pumps and valves.

National Technical Certificate Grade 3
In Marine Steelwork

Job Title	*Nature of Work*
* Metal Cutter (Flame) * Metal Plate Bender * Metal Shipwright * Ship Plater	• Examines drawings and other ship hull specifications. • Marks out metal members and heavy plates to guide workers in cutting, drilling and shaping them for use in ship construction and repair. • Cuts steel plates, angles, tubes, using power shears and flame cutting processes. • Bends and shapes plates for ships under construction and repair. • Lays out templates for use in marking steel members and plates for ship construction.

- Fits, assembles and erects framework and other metal structures of ships by the use of jigs and fixtures, hydraulic jacks and level hoists.
- Marks out draft marks and plimsoll marks.

National Technical Certificate Grade 3
In Mechanical & Electrical Drafting

Job Title	*Nature of Work*
* Electrical Draughtsman * Mechanical Draughtsman	• Applies knowledge and skills of using drafting equipment/instrument for tracing out and printing working drawings. • Makes necessary changes in drawings as required by the senior draftsman/engineer. • Produces working drawings and detailed specifications from engineers'/designers' instructions/sketches for simple machines and mechanical devices. • Produces working drawings and detailed specifications from engineers'/designers' instructions/sketches for simple piping systems and mechanical services working drawings for buildings eg simple air-conditioning duct work, sprinkler systems, water supply and sanitary plumbing systems. • Interprets relevant standard codes and regulations.

National Technical Certificate Grade 3
In Mechanical Servicing

Job Title	*Nature of Work*
* Machinery Fitter (General) * Maintenance Fitter * Metalworking Machine Tool Fitter * Office Machinery Fitter * Plant Maintenance Mechanic * Woodworking Machinery Fitter	• Services and carries out minor repairs on various types of machinery, and related equipment (except electrical components). • Checks faulty machines and related equipment to ascertain nature and location of defects. • Dismantles equipment, wholly or partly, to remove damaged or worn parts. • Replaces defective parts, assembles parts, does supplementary tooling where necessary to ensure accurate fit. • Checks and lubricates machines and related equipment and performs other tasks to keep them in good working order.

- Makes simple replacement parts of machinery or related equipment, using bench tools and/or machine tools.
- Tempers and hardens metal parts.
- Brazes and welds joints and fractures in the course of repair work.

National Technical Certificate Grade 3
In Men's Tailoring

Job Title	*Nature of Work*
* Tailor's Cutter * Tailor (Made-to-Measure Garment) * Tailor (Ready-to-Wear Garment)	• Takes measurements of customers for size. • Drafts patterns and cuts materials for shirts and trousers based on fashion plates or according to customers' specifications. • Assembles trousers for fitting. • Performs fittings and alterations of trousers. • Sews various styles of trousers from ready-cut materials. • Sews various styles of shirts from ready-cut materials.

National Technical Certificate Grade 3
In Metal Fabrication

Job Title	*Nature of Work*
* Furniture Assembler (Sheetmetal) * Metal Cutter (Flame) * Metal Products Assembler * Metal Plate Bender * Sheetmetal Worker (General) * Structural Steelworker (Workshop) * Welder	• Interprets blueprints to fabricate steel structures and piping work. • Draws templates and develops patterns for pipe bending and sheetmetal fabrication. • Marks and cuts to specifications on sheetmetal, steel plates and sections. • Forms, assembles and solders or tack-welds in the process of metal fabrication. • Welds mild steel joints by applying the shielded metal-arc welding process.

National Technical Certificate Grade 3
In Motor Vehicle Mechanics

Job Title	*Nature of Work*
* Motor Vehicle Mechanic (Automobile)	• Services automobiles and other motor vehicles. • Checks vehicles to ascertain nature, extent and location of simple defects. • Uses charts and technical manuals. • Dismantles engines, transmissions, differentials or other parts requiring attention. • Replaces parts such as pistons, rods, gears, valves, bearings, breaker points or gaskets, and accessories such as spark plugs. • Relines and adjusts brakes, solders leaks in radiators, rebushes steering mechanisms and carries out other repairs. • Tunes engine by adjusting ignitions, carburettors, valves and timing mechanisms.

National Technical Certificate Grade 3
In Offset Printing

Job Title	*Nature of Work*
* Lithographic Pressman * Offset Pressman * Printing Maker-up * Printing Pressman	• Sets and operates single-colour sheet-fed offset machines to print single-colour, 2-colour or multi-colour jobs. • Packs printing cylinders with correct amounts of packing sheets and adjusts the pressure between them prior to the positioning and fixing of the plates around the cylinders. • Adjusts both inking and dampening rollers and sets controls for correct supplies of ink and moisture of rollers. • Loads printing presses with paper and adjusts feeding mechanisms. • Adjusts spray powder mechanisms or air blasts to prevent set-offs. • Examines proofs and makes adjustments to get prints to the required standard. • Identifies printing faults (if any) and makes suitable remedies. • Starts printing runs and ensures that printing proceeds smoothly. • Washes up, preserves plates and maintains presses in proper working condition.

81

National Technical Certificate Grade 3
In Precision Machining

Job Title	*Nature of Work*
* Boring Machine Setter-Operator (Metalworking)	• Sets up and operates metal cutting machines such as lathes, milling machines, grinding machines and drilling machines to cut, grind or otherwise shape workpieces to tolerances.
* Drilling Machine Setter-Operator (Metalworking)	• Ascertains job requirements from drawings and/ or other specifications.
* Gear Cutting Machine Setter-Operator (Metalworking)	• Determines sequences and methods of required operations.
* Metalworking Lathe Setter-Operator	• Selects and fixes appropriate cutting tools.
* Metalworking Machine Setter (General)	• Positions and secures workpieces on machines, using jigs, shims, bolts, clamps and other positioning aids and fixing devices.
* Milling Machine Setter-Operator (Metalworking)	• Sets machine controls for rotation speeds, depths of cut, etc. and adjusts machine table stops and guides.
* Precision Grinding Machine Setter-Operator	• Operates automatic or manual controls to feed cutting tools.
* Screw Cutting Machine Setter-Operator (Metalworking)	• Checks accuracy of machining, using measuring instruments.
* Shaping Machine Setter-Operator (Metalworking)	• Repositions workpieces, changes tools and resets machines as necessary.
* Turner	• Marks workpieces prior to machining.
	• Sharpens cutting tools.

National Technical Certificate Grade 3
In Precision Optics

Job Title	*Nature of Work*
* Glass Lens Moulder	• Reads and interprets drawings and specifications.
* Optical Glass Cutter	• Plans sequences of processes for the productions of optical components, such as lenses, prisms, wedges and mirrors.
* Optical Galss Slicer	• Sets up and operates glass working machines, eg sawing and slicing, grinding, curve-generating, milling, diamond smoothing and polishing.
* Optical Glass Slitter	• Measures angles, using auto-collimators and goniometers.
	• Measures refractive indices and dispersive powers, using refractometers.

- Uses interference methods of testing, including test plates and instruments such as Fizeau and Twyman-green interferometers.
- Performs fine-cementing of optical components, using thermo-setting and thermo-plastic cements.
- Makes precision-grade test-plates to match radii of curvatures.

National Technical Certificate Grade 3
In Sheetmetal Fabrication

Job Title	*Nature of Work*
* Furniture Assembler (Sheetmetal) * Metal Products Assembler * Sheetmetal Marker * Sheetmetal Worker (General)	• Examines drawings and other specifications. • Marks out patterns, templates on metal sheets of steel, according to specifications. • Cuts metal to sizes and shapes using hand tools and machines such as snips, shears, and guillotines. • Forms and shapes articles in sheetmetal by operations such as bending, folding, rolling and beating. • Joins sheetmetal fittings by methods such as riveting, seaming, gas welding, soldering and spot welding. • Fabricates and repairs sheetmetal articles like containers, housings, ducts, tubings, cowlings, tanks, vats and other articles or fittings of various shapes. • Makes and repairs kitchen and household utensils, and ornamental articles and fittings in sheetmetal. • Installs, repairs and assembles sheetmetal parts of vehicles.

National Technical Certificate Grade 3
In Upholstery

Job Title	*Nature of Work*
* Furniture Upholsterer * Upholsterer (Aircraft) * Upholsterer (Soft Furnishings)	• Makes upholstered furniture. • Ascertains job requirements from given specifications and drawings. • Selects and prepares furniture frames for upholstery.

- Repairs and strengthens upholstery frames.
- Cuts and fixes spacings, webbings and other forms of support for upholstery.
- Cuts and fixes polyfram, stuffings, and paddings.
- Fixes calico end upholstery covers with tacts, staples or other forms of fittings.
- Measures, cuts and sews covers, zippers, velcro and other forms of closures.
- Removes old and worn upholstery for re-upholstery work.
- Finishes jobs by fitting dust covers, castors and other fittings.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE OF COMPETENCY

Certificate of Competency In Binding & Finishing

Job Title

* Book Sewing Machine Operator
* Bookbinding Machine Operator
* Collating Machine Operator (Bookbinding)
* Covering Machine Operator (Bookbinding)
* Folding Machine Operator (Bookbinding)

Nature of Work

- Performs cutting, folding, collating, stitching, sewing and bindings of books and periodicals.
- Folds printed sheets into sections ready for collating.
- Collates signatures in the correct order.
- Sets and operates a stitcher machine for side or saddle stitch.
- Sews signatures together to form a book block.
- Compresses sewn book blocks to expel air and reduce swelling.
- Sets and operates simple drilling machine.
- Performs padding, gluing, pasting, numbering and other miscellaneous operations.
- Packs finished items for despatch and delivery.
- Assists in setting and operation of sophisticated binding and finishing machines, and book flowline.
- Performs general routine cleaning of shopfloor and simple maintenance of machines.
- Makes dummies of production jobs.

Certificate of Competency In Die-Casting Machine Setting

Job Title

* Centrifugal Casting Machine Operator
* Continuous Casting Machine Operator
* Continuous Rod Casting Machine Operator
* Die Casting Machine Operator
* Ladleman (Metal Casting)
* Metal Caster

Nature of Work

- Removes dies from die-casting machines (of both the hot and cold-chamber types).
- Sets up new dies on machines.
- Checks and prepares machines for trial shots.
- Sets and adjusts operating controls eg spray systems and cycle times.
- Operates machines for try-outs.
- Trouble-shoots casting faults.
- May rectify simple machine faults in the course of setting up machines for casting.

Certificate of Competency
In Electrical Wiring

Job Title	*Nature of Work*
* Installation Electrician (Building) * Overhead Wireman (Electric Power) * Overhead Wireman (Electric Traction)	• Reads drawings to determine locations, types of wiring systems and accessories . • Cuts, threads and bends conduits. • Fabricates brackets and other forms of mechanical supports. • Installs mechanical supports for wiring systems. • Secures conduits and trunkings onto walls or ceilings. • Installs wiring accessories and control gears, draws in cables and terminates conductors to accessories and control gears. • Installs lamps, lighting fittings and electrical apparatuses.

Certificate of Competency
In General Fitting

Job Title	*Nature of Work*
* Machinery Fitter (General) * Machining Fitter-Assembler (General) * Maintenance Fitter * Metal Products Assembler	• Fabricates parts and sub-assemblies of machinery and related equipment to drawing specifications, using bench-fitting tools. • Uses drilling machines to drill, countersink, counterbore and spotface holes in workpieces. • Verifies accuracy of work and dimensional features, using micrometers, gauges and other common measuring tools. • Fits parts or sub-assemblies, using hand tools.

Certificate of Competency
In Heat Treatment

Job Title	*Nature of Work*
* Carboniser (Metal Treating) * Cyanide Hardener * Metal Annealer * Metal Case Hardener * Metal Temperer * Nitrider	• Heats steel articles in furnaces and cools them at predetermined rates to relieve internal stresses. • Restores ductility and refines grain structures. • Hardens steel articles throughout by heating them in furnace and quenches them. • Imparts a hard skin and tough ductile core to steel articles.

* Normaliser (Metal Treating)	• Treats steel articles with chemicals, then heats and quenches or cools them. • Reheats hardened steel articles in a furnace and quenches them to relieve stresses caused in the hardening process and to impart toughness. • Performs related tasks like setting equipment controls for required temperatures and periods of heating. • Sets speeds for conveyors or rollers. • Turns on fuel supplies to equipment. • Lights or adjusts burners, and switches on electric current. • Loads stock of steel articles into equipment and removes articles from furnaces and equipment after treatment.

Certificate of Competency
In Industrial Sewing Machine Mechanics

Job Title	*Nature of Work*
* Textile Machinery Mechanic	• Services and repairs industrial sewing machines. • Sets and adjusts machines for different sewing runs. • Locates and rectifies faults. • Dismantles equipment wholly or partly to remove damaged or worn parts. • Replaces defective worn-out parts. • Tests and adjusts machines and equipment in accordance with manufacturers' instructions. • Lubricates machines and related equipment. • Conducts preventive maintenance inspections on machinery to ensure optimum efficiency.

Certificate of Competency
In Lift Adjustment & Maintenance

Job Title	*Nature of Work*
* Electrical Lift Fitter	• Reads drawings to determine the control sequences of safety and door-operator circuits. • Adjusts the balance point of a lift system. • Adjusts the operation of essential hoistway equipment.

- Adjusts the operation of essential motor-room equipment.
- Checks the reliability and accuracy of operation of safety devices.
- Trouble-shoots safety and door-operator circuits.
- Maintains the emergency-backup and automatic-rescue devices.
- Rescues trapped passengers.

Certificate of Competency In Lift Installation

Job Title	*Nature of Work*
* Electrical Lift Fitter	• Consults installation drawings to determine the locations and specifications of equipment and components. • Cuts and forms trunkings. • Measures, fabricates and aligns brackets. • Installs installation templates. • Installs equipment in motor rooms. • Installs equipment and accessories in hoistways. • Installs and terminates electrical wirings.

Certificate of Competency In Motor Cycle Mechanics

Job Title	*Nature of Work*
* Motor Cycle Mechanic	• Repairs motor cycles, motor scooters, motorised pedal cycles. • Examines machines to ascertain nature, extent and location of defects. • Plans work with charts and technical manuals. • Dismantles engines, transmission and braking systems. • Repairs or replaces parts such as pistons, gears, valves, steering and brakes, bearings, breaker points or gaskets. • Tests repaired machines in workshops or on roads. • Assembles motor cycles from standard export packings.

Certificate of Competency
In Motor Vehicle Electrician's Work

Job Title	*Nature of Work*
* Motor Vehicle Electrician * Vehicle Electrician	• Installs electrical wiring and other electrical equipment for road transport vehicle such as cars, vans, buses, trucks, lorries and forklift trucks. • Repairs electrical wiring and other electrical equipment for light and heavy vehicles. • Services alternators and generators, starting motors, electric motors for windows, windshield wipers and windshield washers. • Overhauls alternators, generators and starting motors. • Services vehicles batteries. • Services accessory equipment. • Installs car radios and cassette recorders. • Diagnoses faults in lighting, charging, starting, ignition, and accessory systems. • Fabricates simple brackets for installing electrical accessories. • Plans work with charts and technical manuals. • Estimates cost of repairs.

Certificate of Competency
In Panel Beating

Job Title	*Nature of Work*
* Auto-Body Repairer * Panel Beater (Vehicle) * Vehicle Body Repairman * Vehicle Sheetmetal Worker	• Fabricates metal parts of vehicle bodies. • Repairs metal parts of vehicle bodies. • Determines types of repair required for vehicle bodies. • Works on light and heavy vehicles to restore original shapes. • Uses oxy-acetylene cutting and welding tools, cutting tools and templates to shape body parts. • Repairs damaged vehicle fenders and grilles. • Straightens damaged body chassis frames. • Tests the repaired vehicles for correct chassis or body alignments.

- Plans work, using charts and technical manuals.
- Assesses cost of repairs.

Certificate of Competency
In Plastic Injection Moulding Machine Setting

Job Title	*Nature of Work*
* Plastic Extruding Machine Operator * Plastic Injection Moulding Machine Operator	• Removes moulds from injection moulding machines. • Mounts moulds on machines. • Sets moulds open and close speeds. • Sets temperatures, timers and pressures on machines. • Operates machines for trial-runs. • Trouble-shoots simple moulding faults. • May rectify simple machine faults in the course of setting up machines for moulding.

Certificate of Competency
In Vehicle Spray Painting

Job Title	*Nature of Work*
* Automobile Painter * Automobile Painter (Motor Vehicle Assembly) * Automobile Repair Painter * Motor Vehicle Body Repainter * Motor Vehicle Painter * Spray Painter (Motor Vehicle)	• Paints motor vehicles such as cars, buses, vans and trucks. • Removes paints from vehicles or damaged parts. • Applies base-coatings on surfaces. • Rubs down base-coating to smooth surfaces. • Mixes paints to obtain required colours. • Sprays final-coating on a vehicle body or particular parts. • Retouches paint work with brushes. • Replaces vehicle trimmings and other fittings. • Protects chrome-plated and other parts which are not to be painted. • Polishes finished surfaces. • Plans work, using charts and technical manuals. • Assesses cost of repairs.

Certificate of Competency
In Woodworking Machine Operation

Job Title

- Boring Machine Operator (Woodworking)
- Carving Machine Operator (Woodworking)
- Dovetailing Machine Operator (Woodworking)
- Dowelling Machine Operator (Woodworking)
- Frame Precision Sawyer (Wood)
- Morticing Machine Operator (Woodworking)
- Planing Machine Operator (Woodworking)
- Precision Sawyer (Wood)
- Routing Machine Operator (Woodworking)
- Sanding Machine Operator (Woodworking)
- Shaping Machine Operator (Woodworking)
- Spindle Carving Machine Operator (Woodworking)
- Tenoning Machine Operator (Woodworking)
- Wood Turner
- Wood Turning Lathe Operator
- Woodworking Machine Operator (General)

Nature of Work

- Operates pre-set woodworking machines.
- Starts machines and operates controls to feed wood to cutting tools.
- Positions wood on machine tables and operates controls to move cutting tools against wood.
- Holds cutting tools against wood.
- Checks accuracy of machined components, using measuring instruments or templates.
- Re-positions wood or re-sets machines as necessary.
- Performs general routine clearing and maintenance of woodworking machines.

PART III: CERTIFICATION TITLES ALREADY PHASED OUT

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE DIPLOMA IN APPLIED ARTS

Diploma in Applied Arts (Graphic Design)

Job Title

* Advertising Illustrator
* Commercial Artist
* Commercial Illustrator
* Graphic Artist
* Graphic Designer
* Package Designer
* Visualiser

Nature of Work

- Creates from concepts, expresses them in thumbnail roughs, layouts and comprehensives, and executes finished art for press advertisements, posters, direct mail advertising materials, logos and corporate identity programmes, package designs and other forms of publicity materials such as calenders, greeting cards and novelty advertising items.
- Studies general requirements and confers with colleagues and clients to determine concepts, styles and approaches, space limitations, consumer targets and media usage.
- Makes detailed studies of subjects requiring designs or illustrations, formulates appropriate designs or illustrations and submits sketches and presentations for approval.
- Executes approved work in the medium most suitable for the proposed method of reproduction.
- Specifies types, executes lettering and defines photographs for designs and finished art.
- Illustrates and designs books and magazines including story illustrations, cover and page designs and fashion illustrations.
- Creates graphics for television programmes, title graphics, animations and story-boards.
- Designs displays and exhibitions and outdoor advertisements.

Diploma in Applied Arts (Interior Design)

Job Title

* Interior Designer

Nature of Work

- Directs his creative ability and technical skills towards analyzing and solving 3-dimensional spatial problems, given form, meaning and character to the internal environment. Interior design work ranges from residential houses to the complexities of public areas found in airports, hotels, shopping centres, offices, etc.

- Presents design solutions both visually and technically through the productions of work plans, elevations, detailing, perspective sketches, models, sample boards, etc.
- Uses effective communication skills and displays tact, adaptability and understanding with clients, contractors and co-workers.
- Estimates quantities and cost of materials involved and prepares working specifications.
- Supervises and co-ordinates contract work and installations, controlling quality and checking specifications.
- May work as a member of a design team on complex projects.

93

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE INDUSTRIAL TECHNICIAN CERTIFICATE

Industrial Technician Certificate In Advertising Art

Job Title

* Advertising Illustrator
* Commercial Artist
* Commercial Illustrator
* Graphic Artist
* Package Designer
* Visualiser

Nature of Work

- Creates from concepts, expresses them in thumbnail roughs, layouts and comprehensives, and executes finished art for press advertisements, posters, direct mail advertising materials, logos and corporate identity programmes, package designs and other forms of publicity materials such as calendars, greeting cards and novelty advertising items.
- Studies general requirements and confers with colleagues and clients to determine concepts, styles and approaches, space limitations, consumer targets and media usage.
- Makes detailed studies of subjects requiring designs or illustrations, formulates appropriate designs or illustrations and submits sketches and presentations for approval.
- Executes approved work in the medium most suitable for the proposed method of reproduction.
- Specifies types, executes lettering and defines photographs for designs and finished art.
- Illustrates and designs books and magazines including story illustrations, cover and page designs and fashion illustrations.
- Creates graphics for television programmes, title graphics and story-boards.
- Designs display and exhibitions and outdoor advertisements.

Industrial Technician Certificate In Air-Conditioning & Refrigeration Engineering

Job Title

* Estimator
* Installation Supervisor
* Maintenance Technician
* Sales Technician
* Service Technician

Nature of Work

- Repairs and maintains air-conditioning and refrigeration plant in hospitals, hotels, industrial and other types of commercial buildings.
- Diagnoses and remedies faults in air-conditioning and refrigeration equipment.
- Prepares work schedules.

- Tests air-conditioning or refrigeration installations against given specifications.
- Starts up and shuts down air-conditioning or refrigeration equipment.
- Estimates material quantities and cost for air-conditioning or refrigeration projects.
- Verifies that all jobs undertaken conform to specifications.

Industrial Technician Certificate
In Automotive Engineering

Job Title	*Nature of Work*
* Automotive Engineering Technician	• Services light and heavy vehicles such as cars, vans, trucks, trailers, etc. • Checks vehicles to ascertain the nature, extent and location of defects. • Overhauls engines, transmissions, final drives, brakes, control gears and suspensions. • Replaces parts such as pistons, bearings, breaker points, diesel fuel pumps, diesel injections and accessories. • Diagnoses engine faults, both for diesel and petrol engines; transmissions, control and electrical systems. • Tests repaired vehicles in workshops or on roads. • Assesses road-worthiness of vehicles. • Performs minor electrical fitting work. • Plans work, using charts and technical manuals. • Assesses cost of repairs. • May specialise in a particular type of vehicle.

Industrial Technician Certificate
In Electronics Engineering (Process Instrumentation & Control)

Job Title	*Nature of Work*
* Electronics Technician * Instrumentation Technician (Electronic)	• Diagnoses and maintains digital process control systems in the process industry. • Operates process control equipment to control temperature, pressure and flow.

- Measures process quantities, eg temperature and pressure, using analogue and digital measuring equipment.
- Diagnoses and maintains measuring equipment, control equipment, instrumentation piping and wiring.

Industrial Technician Certificate
In Furniture Design & Production

Job Title	*Nature of Work*
* Furniture Designer	• Designs interior layout and furniture for homes, public buildings, commercial complexes and other places.
* Production Technician	• Prepares sketches, perspective drawings, working drawings and design details/specifications.
* Supervisor Foreman	• Estimates quantities and costs of jobs/projects.
	• Uses hand tools and operates woodworking machines to carry out various processes, veneering, upholstery, polishing and finishing in making furniture.
	• Performs duties of a junior technician or supervisor on the production floor in woodworking factories.
	• Co-ordinates and supervises renovations and furnishing works for homes, public buildings, commercial complexes and other places, and checks on work schedules, quality and work specifications, etc.

Industrial Technician Certificate
In Industrial Electronics Engineering

Job Title	*Nature of Work*
* Automation Technician	• Operates, maintains, trouble-shoots and repairs industrial electronic equipment.
* Computer Systems Technician	• Measures with electrical and electronic measuring equipment.
* Electronics Engineering Assistant (General)	• Trouble-shoots and repairs automatic control and test equipment.
* Electronics Engineering Technician (General)	• Operates, maintains and repairs SMT equipment.
* Instrumentation Technician (Electronic)	• Trouble-shoots microprocessors, microcomputer peripherals, and other microprocessor-based equipment.
* Radar Technician	

- Performs computer programming in machine language, assembly language and Basic language.

Industrial Technician Certificate
In Industrial Plant Engineering

Job Title	*Nature of Work*
* Mechanical Engineering Technician (General)	• Performs technical tasks, normally under direction and supervision of a plant engineer. • Contributes to installation, efficient operation, maintenance and repair of mechanically functioning plant equipment. • Exercises technical supervision and control, and gives technical guidance to workers engaged in installation, maintenance and repair of mechanically functioning plant equipment. • Prepares plant maintenance and repairs work schedules. • Inspects and regulates functioning of installed mechanical plant equipment. • Co-ordinates test-runs of equipment or sections of plant under his supervision. • Prepares and makes changes in operation manuals. • Applies suitable methods of energy conservation. • Applies knowledge on corrosion prevention on projects.

Industrial Technician Certificate
In Interior Design

Job Title	*Nature of Work*
* Interior Designer	• Designs and plans interiors of residential, commercial, industrial and public buildings. • Studies general requirements and confers with colleagues and clients to determine needs, styles and specific preferences, space limitations, cost, time and work schedules. • Formulates appropriate designs and submits design proposals in the form of sketches, coloured perspectives, plans and views or models showing the components and construction, furniture and furnishings, lighting, ventilation, fittings and colour schemes.

- Estimates quantities and costs of materials and components required.
- Prepares specifications and advises on constraints for construction and installation.
- Supervises and co-ordinates contract work and installation, controlling quality and checking specifications.
- May work in collaboration with building architects to design interiors of entire buildings.
- May write most of the correspondence including getting the local authority's approval for plans and services and assisting in getting tenders for contract work and installation.

Industrial Technician Certificate
In Mechanical Engineering Drawing & Design

Job Title

* Jig & Tool Drafting Technician
* Mechanical Design Technician
* Mechanical Drafting Technician
* Technical Sales Technician

Nature of Work

- Prepares accurate working drawings from designer's sketches, notes and specifications for manufacture of machine tools, mechanical devices, jigs and fixtures, press tools, plastic moulds and related equipment.
- Examines designer's sketches, notes and specifications to make necessary adjustments and supplementary calculations of dimensions, surfaces, volumes and other features of products.
- Makes detailed working drawings for manufacturing from layout drawings, showing exact dimensions, tolerances, finish, materials and all other necessary information for production.
- Makes necessary changes in drawings as required by engineers.
- Designs simple components or parts of machine and equipment.
- Demonstrates mechanical engineering products to customers and provides necessary advisory and sales services.
- Prepares quotations, schedules and despatching procedures for equipment sold.
- Interprets and applies recommended designs of various weld joints for structures, pressure vessels and piping systems in design codes according to drafting standards.

Industrial Technician Certificate
In Printing Technology – Pre-Press Processes

Job Title	*Nature of Work*
* Foreman * Job-planner for Pre-press Processes * Line Leader * Production Co-ordinator * Section Leader	• Supervises areas in the darkroom, camera work, film stripping and platemaking. • Performs trouble-shooting and fault-analysis in these areas. • Performs some management duties. • Plans materials and processes for the production of jobs. • Determines costs and estimates of jobs. • Co-ordinates production of the various stages and departments.

Industrial Technician Certificate
In Printing Technology – Presswork

Job Title	*Nature of Work*
* Foreman * Job-planner for Press-work * Line Leader * Production Co-ordinator * Section Leader * Supervisor	• Supervises letterpress and offset press areas. • Performs trouble-shooting and fault-analysis in these areas. • Performs some management duties. • Plans materials and processes for the production of jobs. • Determines costs and estimates of jobs. • Co-ordinates production at the various stages and departments.

Industrial Technician Certificate
In Three-Dimensional Design

Job Title	*Nature of Work*
* Model Maker	• Designs various craft objects, household items, souvenirs or industrial product models, both decorative and functional pieces, such as ceramic pieces, sculptures, murals, souvenirs and novelties, household items and decorative articles. • Studies general requirements and confers with production/marketing personnel and clients to determine the requirements, styles and preferences, materials and costs.

- Formulates appropriate designs and submits for approval in the form of sketches, coloured renderings or mock-ups.
- Estimates quantities and costs of materials and processes required.
- Prepares prototypes and working specifications.
- Creates models, makes casts/moulds and produces prototypes or finished products.
- Selects and utilises different materials to suit the production processes required.
- May operate a studio workshop or showroom.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE NATIONAL TRADE CERTIFICATE GRADE 2

National Trade Certificate Grade 2
In Accommodation Operations

Job Title	*Nature of Work*
* Hotel Receptionist	• Receives guests at hotels and similar establishments and performs a variety of services for them on arrival, departure and during their stay. • Controls advance bookings, makes reservations and keeps records of rooms occupied. • Receives guests and ascertains their requirements. • Assigns rooms, answers questions relating to hotels, tourists and other amenities. • Presents accounts to departing guests and arranges for clearance of their baggage and departure. • Transmits messages for guests. • Issues room keys and gives instructions to porters. • Receives and sorts incoming mail. • Keeps guests' accounts, prepares bills and receives payments. • May plan, organise and supervise activities of chambermaids and room stewards. • Ensures that rooms are cleaned, checked and released for sale according to schedule. • Inspects the condition of rooms, reports on repairs needed and suggests improvements. • Takes inventories of bed linens and other housekeeping articles. • Attends to guests' requests and complaints. • Trains and evaluates staff. • Administers first-aid in cases of minor injuries.

National Trade Certificate Grade 2
In Automatic Machining (Cam-operated Lathe)

Job Title	*Nature of Work*
* Auto-Lathe Setter-Operator * Metalworking Lathe Setter-Operator	• Sets up, or sets up and operates an automatic lathe controlled by cams to turn, drill, bore or otherwise shape metal workpieces automatically. • Ascertains job requirements from written instructions. • Selects appropriate cutting tools or receives tools. • Presents and arranges machining in the correct sequence. • Positions and secures workpieces on a machine, using collets and other holding devices. • Presets machining sequence by installing and setting cams in the machine. • Fixes tools in position on machine spindles or on tooling stations. • Sets machine controls for cutting speeds, depth of cut etc. • Starts operation of a machine to complete machining automatically, or until a stop-point, indicating a tool change, is reached. • Sets up, or sets up and operates a variety of automatic and semi-automatic lathes. • Reads engineering drawings. • Sharpens cutting tools. • Performs routine service and preventive maintenance of machines.

National Trade Certificate Grade 2
In Electronics Servicing (Consumer Electronics)

Job Title	*Nature of Work*
* Electronic Fitter (Radio, Television and Radar Equipment) * Electronic Products Checker (Quality Assurance) * Electronic Products Inspector and Tester	• Repairs hi-fi equipment and radio receivers in workshops or places of use. • Examines circuit drawings. • Fabricates and constructs chassis. • Prepares and etches printed circuit boards. • Mounts and solders components on boards.

* Electronic Products Quality Checker	• Diagnoses faults with the aid of testing equipment. • Repairs or replaces faulty parts. • Renews and reconnects wiring where necessary. • Tests and adjusts hi-fi equipment. • Maintains and services hi-fi equipment and radio receivers. • Performs modifications to improve design in hi-fi equipment and radio receivers. • Specialises in routine inspection of a particular type of hi-fi equipment or radio receiver.

National Trade Certificate Grade 2
In Electronics Servicing (Television)

Job Title	*Nature of Work*
* Electronic Fitter (Radio, Television and Radar Equipment) * Electronic Products Checker (Quality Assurance) * Electronic Products Inspector and Tester * Electronic Products Quality Checker	• Tests, aligns, adjusts colour television receivers and video cassette recorders. • Diagnoses, repairs and replaces faulty components. • Calibrates video equipment. • Performs minor modification to overcome design faults in video equipment. • Inspects and measures video equipment parts. • Installs and commissions video systems. • Specialises in routine inspection of a particular type of video equipment.

National Trade Certificate Grade 2
In Furniture Making (Wood)

Job Title	*Nature of Work*
* Furniture Maker	• Makes wooden articles of furniture. • Fits and assembles wooden parts to make furniture. • Ascertains job requirements from drawings and specifications. • Selects wood and prepares parts to specifications, using hand and powered tools and woodworking machines. • Trims, glues and assembles parts together.

- Drives nails, dowels or screws through joints to reinforce them.
- Finishes articles, attaches trim, and applies veneer.
- Stains or polishes, and fits hardware and fittings.
- Makes jigs or templates and/or prototypes for production runs.
- Repairs and renews articles of furniture.

National Trade Certificate Grade 2
In Garment Patternmaking (Ladies' Wear)

Job Title	*Nature of Work*
* Garment Patternmaker (Ladies' Wear)	• Measures a finished garment. • Interprets pattern samples. • Takes and records measurements of customers. • Applies measurements of size charts for construction of block patterns. • Prepares patterns of various garment styles such as lingerie, sportswear, casual wear, formal wear, pants, blazers and garments with double-breasted fastenings. • Grades standard pattern for different sizes of garments for ladies. • Designs garment patternmaking and marker lays for production orders. • Arranges pattern pieces to suit the texture, type and design of fabric involved. • Supervises, controls and gives technical advice to assistants. • Estimates quantity of fabric required for different garments.

National Trade Certificate Grade 2
In General Fitting

Job Title	*Nature of Work*
* General Fitter	• Uses bench-fitting hand tools to cut and shape metal parts to the specifications of working drawings. • Plans sequence of operations. • Measures and marks dimensions and reference points on metal stock for bench fitting operations. • Files, chisels, hacksaws, scrapes and does other supplementary tooling, using equipment such as bench drillers, shapers and bench grinders to ensure correct fits. • Performs tasks with a higher degree of skill competence. • Works to close tolerances and high degree of accuracy. • Performs brazing and soldering works. • Machines simple components on a shaper.

National Trade Certificate Grade 2
In Industrial Electronics

Job Title	*Nature of Work*
* Electronic Fitter (Industrial Equipment) * Electronic Fitter (Medical Equipment) * Electronic Products Inspector & Tester * Electronic Signalling Systems Fitter	• Fits, adjusts and repairs various kinds of electronic equipment in factories, workshops or places of use. • Examines drawings and wiring diagrams. • Checks parts for accuracy of fit. • Files, chisels, scrapes and does other supplementary tooling. • Fits parts together or mounts them on chassis or panels, using hand tools. • Connects and solders wires where necessary. • Tests, calibrates and adjusts equipments. • Diagnoses faults with the aid of test instruments. • Dismantles equipment if necessary, and replaces parts and wiring. • Inspects and tests electronic equipment for conformity to manufacturers' standards.

- Checks equipment and parts according to technical specifications.
- Connects units to power source and test devices such as wattmeter, voltmeter or potentiometer.
- Checks components, electrical connections and quality of units.
- Rejects faulty products.
- Records information on inspection tickets.
- Inspects mechanical operation of equipment.
- Inspects components, and equipment in various stages of production.
- Specialises in routine inspection of a particular type of industrial equipment.

National Trade Certificate Grade 2
In Instrumentation & Control

Job Title	*Nature of Work*
* Instrumentation Technician	• Fits and installs electrical, electronic and pneumatic instruments. • Fits and installs electrical and electronic parts of mechanical instruments. • Services and repairs electrical, electronic, pneumatic and mechanical instruments. • Maintains electrical, electronic, pneumatic and mechanical instruments. • Fits and installs process control instruments. • Adjusts process control instruments. • Diagnoses faults in process control instruments. • Carries out general maintenance in process control instruments. • Dismantles and assembles process control instruments. • Maintains and repairs process control instruments.

National Trade Certificate Grade 2
In Mechanical Servicing (Machine Tool)

Job Title	*Nature of Work*
* Maintenance Fitter (Machine Tool)	• Services and repairs metal working machine tools which cut, shape and grind metal to fine tolerances, specialising in machine tools such as drilling, boring, grinding, planing, shaping, milling and lathes. • Examines faulty machinery and related equipment to ascertain nature and location of defects. • Dismantles equipment, wholly or partly, to remove damaged or worn parts. • Repairs or replaces defective parts. • Assembles parts, does supplementary tooling as necessary to ensure accurate fit. • Tests reassembled equipment and makes necessary adjustments. • Checks and adjust machinery mechanisms such as slideways and feed mechanism for wear, backlash and misalignment. • Lubricates machines and related equipment. • Services and repairs hydraulics and pneumatic systems in machine tools. • Conducts preventive maintenance inspection on machinery to ensure optimum efficiency. • Services and repairs machines which cut and shape wood such as sawing, planing, profiling and mortising machines and wood lathes.

National Trade Certificate Grade 2
In Pattern Making

Job Title	*Nature of Work*
* Pattern Maker (Wood)	• Makes patterns or pattern parts, core boxes or core box parts from wood for use in making moulds for metal casting. • Ascertains job requirements from drawings and other specifications. • Prepares necessary full-scale pattern drawings, using squares, rules, protractors, etc. • Selects wood according to type of mould required.

- Makes out wood, using measuring devices such as squares, scribers and contraction rules.
- Cuts and shapes wood to form pattern parts and corebox parts, using woodworking machines and hand tools.
- Fits and fastens parts together to form complete patterns or sections of patterns, coreboxes or sections of coreboxes using glue, screws and dowels.
- Repairs or rebuilds worn or damaged patterns and coreboxes.
- Trims patterns and coreboxes to required limits, using hand tools and smooths with glasspaper.
- Checks accuracy of patterns and coreboxes.
- Paints or varnishes patterns and coreboxes.

National Trade Certificate Grade 2
In Plumbing & Pipe Fitting

Job Title	*Nature of Work*
* Plumber	• Prepares and installs mild steel, copper, stainless steel, PVC pipes for water supply to buildings. • Installs cast iron or PVC pipes to walls for sanitary plumbing systems. • Interprets building plans to estimate the materials required. • Sets and marks out positions of pipes, control valves and sanitary appliances for installations. • Lays vitrified clay, PVC and cast iron pipes for drainage and constructs suitable inspection chambers/manholes. • Installs mild steel, copper and stainless steel pipes for gas and hot water installations. • Performs various tests for sanitary plumbing and drainage systems, water and gas services including the remedies of leakages. • Estimates cost of sanitary plumbing and drainage work. • Designs water supply and sanitary plumbing systems according to the PUB and MOE Regulations. • Identifies appropriate methods of water supply to high-rise buildings.

National Trade Certificate Grade 2
In Precision Mechanics

Job Title	*Nature of Work*
* Precision Mechanic	• Adjusts mechanical instruments and mechanical portions of electrical and scientific instruments. • Repairs scientific instruments to serviceable condition. • Repairs precision instruments including air, hydraulic and mechanical meters and indicators. • Repairs precision measuring tools and gauges. • Repairs surgical and dental tools. • Repairs other precision and mechanical industrial devices. • Brazes or solders metal parts. • Hardens and tempers metal parts. • Produces parts, using hand tools and machine tools. • Maintains serviceability of such instruments.

National Trade Certificate Grade 2
In Watch Repairing

Job Title	*Nature of Work*
* Watch Assembly Line Supervisor * Watch Repairer * Watch Technician	• Repairs, cleans and adjusts watches and clocks. • Examines timepieces through magnifying lenses to discover defects. • Removes balance springs and other parts, using pliers, screw-drivers, tweezers and other tools. • Repairs or replaces damaged parts. • Cleans parts with benzine or other cleaning substances. • Re-assembles and adjusts timepieces. • Lubricates moving parts. • Regulates timepieces movements. • Tests timepieces for magnetism and demagnetises them. • Makes parts, using watch-maker's lathe. • Services electronic watches as well.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE NATIONAL TRADE CERTIFICATE GRADE 3

National Trade Certificate Grade 3 In Accommodation Operations

Job Title	*Nature of Work*
* Cashier * Hotel Receptionist	• Receives guests at hotels and similar establishments and performs a variety of front office services for them on their arrival, departure and during their stay. • Controls advance bookings, makes reservations and keeps records of rooms occupied, receives guests, ascertains their requirements and assigns rooms. • Answers questions relating to hotels, tours and other local services and amenities, transmits messages for guests and presents accounts to departing guests. • Operates cash registers (manual or computerised). • Receives incoming cash and checks it against cash receipts. • Gives changes and cashes cheques. • Handles payments by credit cards and vouchers.

National Trade Certificate Grade 3 In Compositor's Work

Job Title	*Nature of Work*
* Typesetter	• Sets types by hand and on 'hot-metal' machines. • Makes up lines of types, illustration blocks, etc, into pages from layout and takes proofs. • Imposes pages into printing forms ready for letterpress machines. • Determines the use of various type-faces and spacing for various jobs. • Sets types by hand, using the type case and composing stick. • Performs proof reading and carries out necessary corrections and alterations on the types.

National Trade Certificate Grade 3
In Electrical Fitting & Installation (Domestic)

Job Title	*Nature of Work*
* Electrical Fitter (General) * Electrical Fitter (Household Appliance) * Electrical Household Appliance Mechanic * Electrical Installation Sub-Contractor * Electrician (General)	• Installs, maintains and repairs electrical wiring and related equipment in buildings and other structures. • Interprets simple drawings and electrical plans for domestic premises. • Fixes distribution boxes, switches, lamps, lighting fittings and power outlets. • Cuts, bends and installs conduits and trunking, and draws wires through. • Does minor adjustments and repairs to electrical apparatuses, appliances, motors and related equipment. • Tests for defects and makes necessary adjustments, or repairs defective wiring and related equipment. • Applies safety precautions at all times and installs wiring in accordance with the Code of Practice, Wiring of Electrical Equipment of Buildings and other statutory regulations.

National Trade Certificate Grade 3
In Electrical Fitting and Installation (Industrial)

Job Title	*Nature of Work*
* Building Maintenance Electrician * Electrical Fitter (General) * Electrical Installation Sub-Contractor * Electrician (General) * Installation Electrician (Building)	• Installs, maintains and repairs electrical wiring and related equipment in buildings and other structures. • Interprets simple drawings and electrical plans for industrial premises. • Fixes distribution boxes, switches, lamps, lighting fittings and power outlets. • Cuts, bends and installs conduits and trunking, and draws wires through. • Does minor adjustments and repairs to electrical apparatuses, appliances, motors and related equipment.

National Trade Certificate Grade 3
In Fine Jewellery

Job Title	*Nature of Work*
* Gem Setter * Goldsmith * Jeweller * Jewellery Repairer	• Makes complete jewellery articles such as rings, brooches and bracelets. • Interprets designs and specifications. • Prepares or makes moulds. • Melts platinum, gold, silver or their alloys and puts into moulds. • Shapes moulded pieces according to drawings or other specifications by cutting, filing, heating, turning and bending. • Engraves letters and ornamental designs. • Forms prongs for stone settings. • Cuts, polishes and engraves gems and precious stones and secures them in settings. • Assembles finished parts of jewellery and attaches clasps or decorations by soldering or other means. • Smooths, coats and polishes metal surfaces.

National Trade Certificate Grade 3
In Furniture Making (Wood)

Job Title	*Nature of Work*
* Cabinet Maker * Furniture Maker * Woodworking Machine Setter-Operator	• Prepares timber to size and produces simple articles made of wood from samples or blueprints. • Makes and repairs simple wooden furniture using hand tools and portable power tools. • Operates basic woodworking machines for sawing, shaping, planing or turning wooden products in a safe manner. • Performs simple maintenance duties eg oiling and cleaning woodworking machines. • Fixes common fixtures and fittings in furniture. • Applies simple finishing and polishing to wood articles.

National Trade Certificate Grade 3
In General Fitting

Job Title	*Nature of Work*
* Machinery Fitter (General) * Maintenance Fitter	• Uses bench-fitting hand tools to cut and shape metal parts to specifications. • Checks work with micrometers, gauges and other measuring instruments. • Checks accuracy of fits. • Calculates measurements and plans sequence of operations. • Measures and marks dimensions and reference points on metal stock for bench fitting operations. • Files, chisels, hacksaws, scrapes and does other supplementary tooling, using equipment such as bench drillers, shapers and bench grinders, to ensure correct fits.

National Trade Certificate Grade 3
In Instrumentation & Control

Job Title	*Nature of Work*
* Electronics Fitter (Instruments)	• Fits, adjusts, maintains and repairs electrical, electronic and pneumatic instruments and electrical parts of mechanical instruments. • Fits, adjusts, maintains and repairs instruments for process control.

National Trade Certificate Grade 3
In Letterpress Printing

Job Title	*Nature of Work*
* Letterpress Operator	• Sets and operates platen and cylinder presses and prints one-colour, 2-colour and multi-colour jobs. • Performs numbering, scoring, perforating, die-cutting, blind-embossing, and gold-foil embossing on these presses. • Mixes inks for colour matching and printing.

National Trade Certificate Grade 3
In Pattern Making

Job Title	*Nature of Work*
* Pattern Maker (Wood)	• Reads, interprets engineering drawings and converts into pattern layouts including contraction and machining allowances, drafts, moulds joint lines, coreprints and clearances. • Constructs patterns, core boxes, strickles and templates with hand tools, machine tools and measuring equipment used in forming sand mould for metal casting. • Repairs and modifies broken or damaged patterns. • Coats patterns with appropriate paints and varnishes to improve their surface finishes and protect the wood. • Colour codes the different parts of patterns.

National Trade Certificate Grade 3
In Plumbing & Pipe Fitting

Job Title	*Nature of Work*
* Plumber	• Maintains and uses plumbing hand tools. • Cuts, bends and joins mild steel pipes, stainless steel tubes, copper tubes, PVC pipes of smaller diameters of up to 25 mm, and cast iron pipes. • Assembles taps, valves and flushing cisterns. • Installs wash basins, sinks, low or high level flushing cisterns, including the running and fixing of cold water services and waste pipes. • Repairs leaky pipes, taps, valves, malfunctioning and overflowing cisterns and clears blockages in waste pipes of sinks, basins and floor traps. • Makes simple calculations such as calculating the circumference of circles, length of arcs of pipes, quantity of materials and wastages, etc.

National Trade Certificate Grade 3
In Watch Repairing

Job Title	*Nature of Work*
* Watch Clock Assembler	• Assembles clocks and watches in proper order.
* Watch Clock Repairer	• Services and repairs mechanical watches.
	• Carries out minor trouble-shooting for faulty areas.
	• Replaces faulty parts and casing parts.
	• Tests and adjusts watches with timing machines.

National Trade Certificate Grade 3
In Woodmachining

Job Title	*Nature of Work*
* Woodworking Machine Setter-Operator (General)	• Prepares timber to size from cutting lists and marks out on workpieces from simple working drawings.
* Wood Shaping Machine Setter-Operator	• Uses woodworking hand tools to make simple wooden articles from drawings.
	• Sets and operates woodworking machines to cut or shape wood to specifications.
	• Selects and fixes jigs, templates and appropriate cutting tools in machines.
	• Sets guides and stops for repetitive machining.
	• Changes and replaces saw blades and planer knives.
	• Cleans and lubricates woodworking machines.
	• Operates planer knife grinders to grind and sharpen planer knives.
	• Uses basic materials and fittings in woodworking.

JOB TITLES AND NATURE OF WORK OF HOLDERS OF THE CERTIFICATE OF COMPETENCY

Certificate of Competency In Barbending

Job Title	*Nature of Work*
* Barbender	• Cuts steel rods to the required lengths. • Bends steel rods to the required shapes and sizes. • Selects steel rods according to specifications. • Bends steel rods of huge diameters, using machines. • Splices rods together with wires. • Places rods in positions. • Fixes steel reinforcements in correct positions according to the drawings. • Interprets simple working drawings. • Interprets bar schedules. • Prepares bar schedules for simple projects.

Certificate of Competency In Bricklaying

Job Title	*Nature of Work*
* Bricklayer * Hollow Block-Layer	• Lays bricks in various bonds. • Lays blocks and similar building blocks in various bonds. • Constructs brick walls. • Constructs brick arches. • Constructs brick pavements. • Constructs brick steps. • Constructs brick partitions. • Plumbs brick walls and other brickwork projects as work proceeds. • Levels walls and other brickwork projects as work proceeds. • Sets out wall constructions and other brickwork projects. • Solves brick bonding solutions for return corners, T-junctions, cross-walls, etc.

Certificate of Competency
In Building Carpentry

Job Title	*Nature of Work*
* Carpenter (Construction)	• Cuts and shapes wood by using hand tools, portable electric tools and machines. • Constructs and repairs joinery and carpentry work in workshops and construction sites. • Fits and installs doors, windows, partitions and other wooden fixtures of buildings.

Certificate of Competency
In Building Carpentry (Formwork)

Job Title	*Nature of Work*
* Carpenter (Construction)	• Marks out and cuts wood to be assembled for wooden formwork. • Assembles wooden formwork from pre-fabricated wooden parts. • Assembles parts of wooden formwork on sites, and screws, nails or clamps them together. • Assembles and places in position wooden formwork into which concrete is poured and allowed to set. • Places stays or ties between parts of wooden formwork on sites, and screws, nails or clamps them together. • Places stays or braces between partitions of wooden formwork to give structures the necessary rigidity. • Plumbs, levels and aligns formwork. • Drills holes on wooden formwork for tie bars. • Dismantles formwork when concrete has set. • Repairs damaged wooden formwork. • Cleans off concrete adhering to formwork and applies formwork release agents. • Reshores new concrete structures.

Certificate of Competency
In Building Carpentry (Joinery)

Job Title	*Nature of Work*
* Construction Carpenter * Construction Joiner	• Cuts, assembles and erects joinery works. • Works from plans, sketches or instructions received. • Selects wood and other materials to be used. • Marks out reference points according to patterns or plans to facilitate cutting and shaping. • Cuts and shapes wood, using hand tools or machines. • Performs operations such as sawing, grooving, planing and sanding. • Assembles wooden parts, using glue, screws, nails and other means. • Fits, assembles and installs wooden fixtures such as doors, windows, partitions and panellings. • Fits and installs ironmongery. • Maintains and sharpens tools. • Repairs joinery works. • Peforms other related tasks.

Certificate of Competency
In Mobile Crane Operation

Job Title	*Nature of Work*
* Crane Operator (Mobile Crane)	• Operates cranes mounted on wheels or crawler trucks. • Practices safety rules and regulations as imposed by the Ministry of Labour. • Checks working conditions of cranes before use. • Drives cranes to work sites. • Starts crane motors and manipulates controls to position crane, crane jib (boom) and lifting tackles. • Raises, lowers and places loads in desired positions. • Reads the nature of loads he is handling. • Reads signals from the counterpart.

Certificate of Competency
In Painting

Job Title	*Nature of Work*
* Painter (Building)	• Removes old paints from wooden surfaces and ferrous metal surfaces. • Fills nail holes and cracks on wooden surfaces with appropriate filter and materials. • Fills holes and cracks on plastered walls with appropriate materials. • Patches uneven ferrous metal surfaces with appropriate putty. • Sands wooden and metal surfaces in correct sequences of operation and uses appropriate types of sand-paper. • Applies appropriate chemical solution or rust convertors on ferrous metal sheets. • Applies wall sealers onto plastered walls with brushes or paint rollers. • Applies metal and wood primer onto ferrous metals and wooden surfaces with paint brushes or spray guns. • Applies undercoats onto plastered walls and wooden surfaces with paint brushes or paint rollers. • Applies finishing coats onto plastered walls, wooden surfaces and ferrous metal surfaces. • Applies coats of varnish, shellac and lacquer onto wooden surfaces with shellac brushes or spray guns. • Calculates the areas of simple geometrical figures.

Certificate of Competency
In Pipe Fitting

Job Title	*Nature of Work*
* Pipe Fitter	• Cuts, bends, threads and joins mild steel pipes, copper tubes, stainless steel pipes and PVC pipes. • Cuts, joins and installs cast iron pipes to walls for 'one-pipe' and 'two-pipe' systems of sanitary plumbing. • Reads and interprets building plans to estimate the materials required.

- Sets and marks out positions of pipes, control valves and sanitary appliances for installation.
- Lays vitrified clay pipes, PVC pipes and cast iron pipes.
- Constructs inspection chambers/manholes, installs sanitary, water and gas systems to buildings.
- Installs, runs and maintains hot water pipes and heaters to sinks, basins and baths.
- Carries out various testing for sanitary plumbing and systems, water and gas services including the remedies of leakages.
- Repairs holes in brickwork or concrete affected by work.

Certificate of Competency In Plastering

Job Title	*Nature of Work*
* Plasterer	• Applies base coats of plaster to interior and exterior walls. • Applies base coats of plaster to ceilings and other structures. • Produces a finely textured finish on walls or ceilings etc. • Produces a smooth finish on walls or ceilings etc. • Produces a wood float finish on floors. • Provides level points for rendering. • Plumbs surfaces of plaster. • Produces a flat plaster on walls etc. • Produces a flat rendering on floors. • Works skilfully with long wooden floats. • Screeds the floor with cement mortar/ granite chips to semi-smooth, granolithic and monolithic finishes.

Certificate of Competency
In Tiling

Job Title

* Mosaic Cutter and Setter
* Paving Worker
* Terrazzo Worker
* Tiler

Nature of Work

- Prepares walls/floors for tiling.
- Prepares base coats to receive tiles for walls/floors.
- Fixes glazed tiles and ceramic tiles to walls and other structures.
- Fixes glazed and unglazed mosaic tiles to walls and other structures.
- Plumbs wall tiles.
- Lays ceramic tiles and mosaic tiles to floors.
- Prepares design patterns for ceramic and glazed tiles for walls/floors etc.
- Calculates the quantities of tiles required.
- Levels floor tiles.
- Operates tile cutting machines safely and skilfully.
- Fills joints of tiles with cement.
- Polishes tiles to a clean finish.

EQUIVALENCE OF QUALIFICATIONS

With the formation of ITE, the National Trade Certificate issued by the former Vocational & Industrial Training Board has been re-named as the National Technical Certificate. Before the ITE was formed, its predecessors, the Technical Education Department of the Ministry of Education and the Industrial Training Board, also issued certificates to certify industrial skills. Certificates issued then were the Craft Certificates, Advanced Craft Certificates, Trade Certificates, Trade Two Certificates, Applied Arts Certificates, Manual Arts Certificates and the Artisan Certificates. The VITB's other predecessor, the Adult Education Board also issued certificates to certify commercial skills.

The equivalence of these certificates to the business studies certificates, the National Technical Certificates and the Certificate of Competency issued by the ITE has been established to facilitate comparison. The equivalence are as follows:

Certificate In Business Studies (Accounting) Status

* Certificate In Accounting issued by the former Adult Education Board

Certificate In Business Studies (Secretarial Practice) Status

* Private Secretary's Certificate issued by the former Adult Education Board

Certificate In Office Skills Status

* Commercial Practice Certificate issued by the former Adult Education Board

National Technical Certificate Grade 2 (NTC-2) Status

* Advanced Craft Certificate issued by the former Technical Education Department
* Trade Two Certificate issued by the former Technical Education Department and the Industrial Training Board
* Trade Test Grade Two Certificate issued by the former Industrial Training Board
* National Trade Certificate Grade 2 issued by the former Industrial Training Board and the Vocational & Industrial Training Board

National Technical Certificate Grade 3 (NTC-3) Status

* Craft Certificate issued by the former Technical Education Department
* Trade Certificate issued by the former Technical Education Department and the Industrial Training Board
* Applied Arts Certificate issued by the former Technical Education Department and Industrial Training Board
* Trade One Certificate issued by the former Industrial Training Board
* National Trade Certificate Grade 3 issued by the former Industrial Training Board and the Vocational & Industrial Training Board

Certificate of Competency (CoC) Status

The Artisan Certificate issued by the former Technical Education Department and the Industrial Training Board in the following trade areas are considered equivalent to the CoC in the same trades:

- Barbending/Concreting
- Bricklaying
- Building Carpentry
- Decorative Tiling
- Electrical Wireman
- Masonry
- Painting/Decorating
- Panel Beating
- Vehicle Spray Painting

CERTIFICATION TITLES WHICH HAVE BEEN CHANGED

Change of Certificate Title

Existing Title	*Former Title*
* Certificate in Business Studies (Accounting)	Certificate in Business Studies
* Certificate in Office Skills	Preliminary Certificate in Business Studies

Industrial Technician Certificate

* Industrial Electronics Engineering	Electronics Engineering (Industrial Electronics)

National Technical Certificate Grade 1

* Precision Machining Technology	Precision Engineering (Machining Technology)
* Precision Tooling Design	Precision Engineering (Tool & Die Design)
* Precision Tooling Technology	Precision Engineering (Tool & Die Making)

National Technical Certificate Grade 2

* Air-Conditioning & Refrigeration	Air-Conditioning & Refrigeration Mechanics
* Diesel Engine Mechanics	Heavy Duty Diesel Mechanics
* Electrical Installation & Servicing	Electrical Fitting & Installation
* Electro-Mechanical Maintenance Fitting	Electro-Mechanical Fitting
* Electronics Servicing (Digital Equipment)	Digital Electronics & Equipment Servicing
* Electronics Servicing (Electronics Instrumentation)	Electronics Servicing (Instrumentation)

National Technical Certificate Grade 2

Existing Title	*Former Title*
* Electronics Servicing (Video Technology)	Electronics Servicing (Video Equipment)
* Fashion Garment	Dressmaking
* Hairstyling	Hairdressing
* Marine Mechanics	Marine Fitting
* Marine Steelwork	Steelwork Fabrication; Hull Fabrication
* Mechanical Servicing (General)	Maintenance Fitting (General); Maintenance Fitting
* Mechanical Servicing (Machine Tools)	Maintenance Fitting (Machine Tools)
* Precision Machining	Precision Machining (General)
* Precision Machining (Grinder)	Grinding
* Precision Machining (Lathe)	Turning
* Precision Machining (Miller)	Milling
* Precision Tooling (Injection Mould)	Tool & Die Making (Injection Mould)
* Precision Tooling (Press Tool)	Tool & Die Making (Press Tool)
* Tool & Die Making (General)	Tool & Die Making; Toolmaking
* Welding	Arc Welding

National Technical Certificate Grade 3

* Air-Conditioning & Refrigeration	Air-Conditioning & Refrigeration Mechanics
* Diesel Engine Mechanics	Heavy Duty Diesel Mechanics
* Electrical Installation & Servicing	Electrical Fitting & Installation
* Electronics Servicing	Industrial Electronics
* Electro-Mechanical Servicing	Electro-Mechanical Maintenance Fitting; Electro-Mechanical Fitting
* Fashion Garment	Dressmaking
* Food & Beverage Service	Food & Beverage Operations
* Food Preparation (Chinese Cuisine)	Food Production
* Food Production	Food Preparation
* Hairstyling	Hairdressing

National Technical Certificate Grade 3

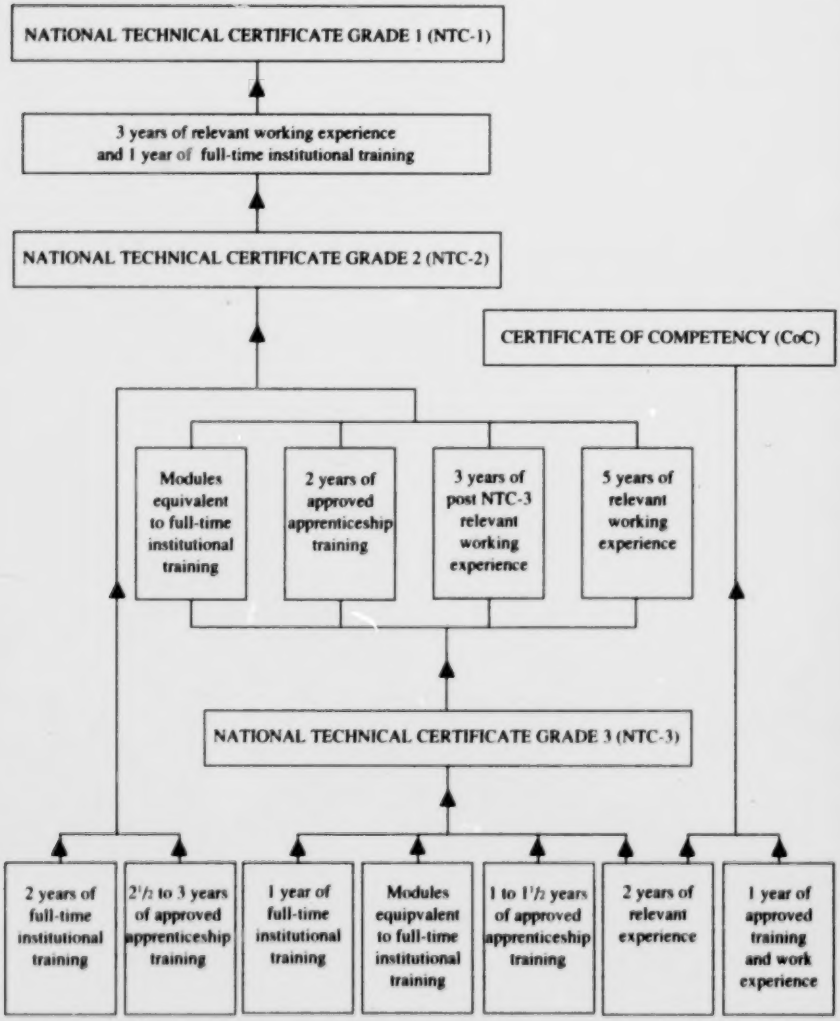
Existing Title	*Former Title*
* Marine Mechanics	Marine Fitting
* Marine Steelwork	Steelwork Fabrication; Hull Fabrication
* Mechanical Servicing	Maintenance Fitting
* Men's Tailoring	Gent's Tailoring
* Precision Machining	Metal Machining

Certificate of Competency

* Binding & Finishing	Bindery
* Painting	Painting/Decorating
* Tiling	Masonry

Appendix C

NATIONAL TECHNICAL CERTIFICATE AND CERTIFICATE OF COMPETENCY SYSTEMS


NATIONAL TECHNICAL CERTIFICATE GRADE 1 (NTC-1)
3 years of relevant working experience and 1 year of full-time institutional training
NATIONAL TECHNICAL CERTIFICATE GRADE 2 (NTC-2)
CERTIFICATE OF COMPETENCY (CoC)
Modules equivalent to full-time institutional training
2 years of approved apprenticeship training
3 years of post NTC-3 relevant working experience
5 years of relevant working experience
NATIONAL TECHNICAL CERTIFICATE GRADE 3 (NTC-3)
2 years of full-time institutional training
2½ to 3 years of approved apprenticeship training
1 year of full-time institutional training
Modules equipvalent to full-time institutional training
1 to 1½ years of approved apprenticeship training
2 years of relevant experience
1 year of approved training and work experience

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